FY2013

SUNFLOWER ARMY AMMUNITION PLANT

Installation Action Plan

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Statement of Purpose

The purpose of the Installation Action Plan (IAP) is to outline the total multiyear Cleanup Program for an installation. The plan identifies environmental cleanup requirements at each site or area of concern (AOC), and proposes a comprehensive, installation-wide approach, with associated costs and schedules, to conduct investigations and necessary remedial actions (RA).

In an effort to coordinate planning information between the restoration manager, US Army Environmental Command (USAEC) and Sunflower Army Ammunition Plant (SFAAP), an IAP was completed. The IAP is used to track requirements, schedules and tentative budgets for all Army installation cleanup programs.

All site-specific funding and schedule information has been prepared according to projected overall Army funding levels and is, therefore, subject to change.

Acronyms

ACM	Asbestos Containing Material
AEDB-CC	Army Environmental Database-Compliance Cleanup
AEDB-R	Army Environmental Database-Restoration
AOC	Area of Concern
ARAR	Applicable or Relevant and Appropriate Requirement
AST	Aboveground Storage Tank
ATSDR	Agency for Toxic Substances and Disease Registry
bcy	bank cubic yards
BRAC	Base Realignment and Closure
CC	Compliance-related Cleanup
CCC	Calcium Carbonate Cake
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CMI	Corrective Measures Implementation
CMI(C)	Corrective Measures Implementation (Construction)
CMS	Corrective Measures Study
CO	Consent Order
CR	Compliance-Related
CS	Confirmatory Sampling
CWP	Contaminated Waste Processor
cy	cubic yard
DD	Decision Document
DDT	Dichloro-Diphenyl-Trichloroethane
DERP	Defense Environmental Restoration Program
DNT	Dinitrotoluene
DoD	Department of Defense
DPT	Direct Push Technology
DRO	Diesel Range Organics
EBS	Environmental Baseline Survey
ER	Emergency Removal
ER,A	Environmental Restoration, Army
FRA	Final Remedial Action
ft	feet
FTW	Fluorescent Tube Well
FY	Fiscal Year
GN	Guanidine Nitrate
GRO	Gasoline Range Organics
IAP	Installation Action Plan
ICM	Interim Corrective Measures
IR	Installation Restoration
IRA	Interim Remedial Action
IRP	Installation Restoration Program
K	thousand
KDHE	Kansas Department of Health and Environment
kg	kilogram
KSWQS	Kansas Surface Water Quality Standards

Acronyms

LTM	Long-Term Management
LUC	Land Use Control
LWTP	Liquid Waste Treatment Plant
M	million
MC	Munitions Constituents
MEC	Munitions and Explosives of Concern
mg	Milligrams
MMRP	Military Munitions Response Program
MNA	Monitored Natural Attenuation
MR	Munitions Response
N/A	Not Applicable
NC	Nitrocellulose
NFA	No Further Action
NG	Nitroglycerine
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NQ	Nitroguanidine
NSE	Nitroguanidine Support Equipment
ODUSD (I&E)	Office of Deputy Under Secretary of Defense for Installation and Environment
PAH	Polycylic Aromatic Hydrocarbons
PBC	Performance Based Contract
PCB	Polychlorinated Biphenyls
PCE	Tetrachloroethylene
POL	Petroleum, Oil and Lubricants
POTW	Publicly Owned Treatment Works
ppm	parts per million
PRG	Preliminary Remediation Goal
RA	Remedial Action
RAB	Restoration Advisory Board
RC	Response Complete
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RFI	RCRA Facility Investigation
RI	Remedial Investigation
RIP	Remedy-in-place
ROD	Record of Decision
RRSE	Relative Risk Site Evaluation
RWTP	River Water Treatment Plant
SAC	Sulfuric Acid Concentrator
SFAAP	Sunflower Army Ammunition Plant
SOB	Statement of Basis
SRL	Sunflower Redevelopment, LLC
STP	Sewage Treatment Plant
SVOC	Semi-Volatile Organic Compound
SWMU	Solid Waste Management Unit

Acronyms

TAPP	Technical Assistance for Public Participation
TCLP	Toxicity Characteristic Leaching Procedure
TEC	Threshold Effects Concentrations
TMCL	Target Media Cleanup Level
TPH	Total Petroleum Hydrocarbons
TRC	Technical Review Committee
TSCA	Toxic Substances Control Act
TSDF	Treatment, Storage and Disposal Facilities
USACE	US Army Corps of Engineers
USACHPPM	US Army Center for Health Promotion and Preventive Medicine
USAEC	US Army Environmental Command
USAEHA	US Army Environmental Hygiene Agency
USEPA	US Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compound

Acronym Translation Table

CERCLA		RCRA
Preliminary Assessment(PA)	=	RCRA Facility Assessment(RFA)
Site Inspection(SI)	=	Confirmation Sampling(CS)
Remedial Investigation/Feasibility Study(RI/FS)	=	RCRA Facility Investigation/Corrective Measures Study(RFI/CMS)
Remedial Design(RD)	=	Design(DES)
Remedial Action (Construction)(RA(C))	=	Corrective Measures Implementation (Construction)(CMI(C))
Remedial Action (Operation)(RA(O))	=	Corrective Measures Implementation (Operation)(CMI(O))
Long Term Management(LTM)	=	Long Term Management(LTM)
Interim Remedial Action(IRA)	=	Interim Measure(IM)

Site Alias List

AEDB-R/AEDB-CC Site ID to Alias List

AEDB-R/AEDB-CC #	Alias
CCSAAP-055	SWMU 55
CCSAAP-061	SWMU 61
CCSAAP-069	SWMU 69
CCSAAP-070	SWMU 70
CCSAAP-103	AOC 3
CCSAAP-113	AOC 13
CCSAAP-126	AOC 26
SAAP-002	SWMU 2
SAAP-003	SWMU 3
SAAP-004	SWMU 4
SAAP-005	SWMU 5
SAAP-006	SWMU 6
SAAP-007	SWMU 7
SAAP-008	SWMU 8
SAAP-009	SWMU 9
SAAP-010	SWMU 10
SAAP-011	SWMU 11
SAAP-012	SWMU 12
SAAP-013	SWMU 13
SAAP-014	SWMU 14
SAAP-015	SWMU 15
SAAP-016	SWMU 16
SAAP-017	SWMU 17
SAAP-018	SWMU 18
SAAP-019	SWMU 19
SAAP-020	SWMU 20
SAAP-021	SWMU 21
SAAP-022	SWMU 22
SAAP-024	SWMU 24
SAAP-025	SWMU 25
SAAP-026	SWMU 26
SAAP-027	SWMU 27
SAAP-030	SWMU 30
SAAP-031	SWMU 31
SAAP-032	SWMU 32
SAAP-033	SWMU 33
SAAP-034	SWMU 34

SAAP-035	SWMU 35
SAAP-036	SWMU 36
SAAP-037	SWMU 37
SAAP-038	SWMU 38
SAAP-039	SWMU 39
SAAP-040	SWMU 40
SAAP-041	SWMU 41
SAAP-042	SWMU 42
SAAP-043	SWMU 43
SAAP-044	SWMU 44
SAAP-045	SWMU 45
SAAP-046	SWMU 46
SAAP-047	SWMU 47
SAAP-048	SWMU 48
SAAP-050	SWMU 50
SAAP-051	SWMU 51
SAAP-052	SWMU 52
SAAP-053	SWMU 53
SAAP-054	SWMU 54
SAAP-057	SWMU 57
SAAP-058	SWMU 58
SAAP-059	SWMU 59
SAAP-062	SWMU 62
SAAP-063	SWMU 63
SAAP-064	SWMU 64
SAAP-065	SWMU 65
SAAP-066	SWMU 66
SAAP-067	SWMU 67
SAAP-101	AOC 1
SAAP-102	AOC 2
SAAP-105	AOC 5
SAAP-106	AOC 6
SAAP-107	AOC 7
SAAP-108	AOC 8
SAAP-109	AOC 9
SAAP-110	AOC 10
SAAP-111	AOC 11

SAAP-112	AOC 12
SAAP-114	AOC 14
SAAP-115	AOC 15
SAAP-116	AOC 16
SAAP-117	AOC 17
SAAP-118	AOC 18
SAAP-119	AOC 19
SAAP-120	AOC 20
SAAP-121	AOC 21
SAAP-122	AOC 22
SAAP-123	AOC 23
SAAP-124	AOC 24

Installation Information

Installation Locale

Installation Size (Acreage): 9,065.00
City: DeSoto
County: Johnson
State: Kansas
Other Locale Information

The SFAAP is located on 9,065 acres in rural northwestern Johnson County, Kansas. It is approximately three miles southwest of De Soto, Kansas and 28 miles southwest of Kansas City, Missouri. It is roughly rectangular in shape and about six miles long by three miles wide, with the long axis oriented in a north- south direction.

Originally known as the Sunflower Ordnance Works, SFAAP was established in 1941 on 10,747 acres as the world's largest powder and propellant plant. Production of propellant began in 1943 and played a significant role in US history by providing munitions for three major military conflicts: World War II (WWII), the Korean Conflict and the Vietnam Conflict. The installation was determined to be in excess of Army needs in 1997. All of the Sunflower property was transferred to a private entity, Sunflower Redevelopment LLC, on Aug. 5, 2005. Two-thirds of the transferred property was contaminated. The Army retains the liability for the cleanup and explosive decontamination of SFAAP.

Installation Mission

Decontaminate explosive facilities, and clean up environmental contamination.

Lead Organization

Base Realignment and Closure Division

Lead Executing Agencies for Installation

Sunflower Redevelopment, LLC (SRL)

Regulator Participation

Federal	US Environmental Protection Agency (USEPA) Region VII
State	Kansas Department of Health and Environment (KDHE), Bureau of Environmental Remediation

National Priorities List (NPL) Status

SUNFLOWER ARMY AMMUNITION PLANT is not on the NPL

Installation Restoration Advisory Board (RAB)/Technical Review Committee (TRC)/Technical Assistance for Public Participation (TAPP) Status

RAB established 1998

Installation Program Summaries

IRP

Primary Contaminants of Concern: Asbestos, Dioxins/Dibenzofurans, Explosives, Herbicides, Lead Based Paint, Metals, Munitions and explosives of concern (MEC), Munitions constituents (MC), Nitrate/Nitrite, Pesticides, Petroleum, Oil and Lubricants (POL), Polychlorinated Biphenyls (PCB), Polycyclic Aromatic Hydrocarbons (PAH), Semi-volatiles (SVOC), Volatiles (VOC)

Affected Media of Concern: Groundwater, Sediment, Soil, Surface Water

CR

Primary Contaminants of Concern: Asbestos, Dioxins/Dibenzofurans, Lead Based Paint, Metals, Nitrate/Nitrite, Pesticides, Petroleum, Oil and Lubricants (POL), Polychlorinated Biphenyls (PCB), Polycyclic Aromatic Hydrocarbons (PAH), Semi-volatiles (SVOC), Volatiles (VOC)

Affected Media of Concern: Groundwater, Sediment, Soil, Surface Water

Cleanup Program Summary

Installation Historic Activity

Originally known as the Sunflower Ordnance Works, SFAAP was established in 1941 on 10,747 acres as the world's largest powder and propellant plant. Production of propellant began in 1943 and played a significant role in US history by providing munitions for three major military conflicts: WWII, the Korean Conflict and the Vietnam Conflict. The installation was declared excess of Army needs. All of the Sunflower property was transferred to a private developer, SRL. The entire cleanup program was contracted with SRL under a performance-based contract (PBC).

Additional installation operations included the manufacture and regeneration of nitric and sulfuric acids, and munitions proving.

During the course of its 50-plus years of operation, various hazardous substances were released both inadvertently and intentionally to the environment. These releases, which are not uncommon at major industrial facilities, were from production line areas and various support areas. There are 70 Resource Conservation and Recovery Act (RCRA) solid waste management units (SWMUs), and 27 AOCs. The USEPA proposed listing the installation on the NPL in 1995. The USEPA removed the installation from proposed listing on the NPL in 2005.

Preliminary investigations have been conducted on all SWMUs. In addition to studying each SWMU, three SWMUs have received final closure. Studies show that five SWMUs will not require any RA for soil. Soil cleanups have been completed at 12 SWMUs/AOCs. Three SWMUs are landfills in post-closure care. Four AOCs are being handled under existing SWMUs. Special work performed on the plant includes a community relations plan, a groundwater investigation, a benthic macro invertebrate study, a grazing study, an ecological risk assessment, a Public Health Assessment (via the Agency for Toxic Substances and Disease Registry [ATSDR]), an off-site well survey, and an installation-wide stream study.

Thirteen new SWMUs and 22 AOCs were identified in the 1998 installation-wide Environmental Baseline Survey (EBS). US Army Center for Health Promotion and Preventive Medicine (USACHPPM) performed relative risk site evaluations (RRSE) on those sites that are eligible for Environmental Restoration, Army (ER,A) funding.

Two new AOCs were added for the soil cleanup underneath explosive foundations and explosive sewers.

Three new SWMUs and three new AOCs were found and added during the project reset in 2013.

Installation Restoration Program (IRP) investigations have been conducted at SAAP-001-053. Several of these sites have been remediated, or require no further action (NFA). The remaining sites between SAAP-001 and 053 that require further action will have additional investigations to fill data gaps and will be remediated if required. SAAP-054 through 124 will be investigated and remediated if required.

Installation Program Cleanup Progress

IRP

Prior Year Progress: Conducted long-term management (LTM) at SWMUs 11, 33, 35, 41, 48, 50, and AOC 1.

Future Plan of Action: Perform RCRA facility investigations (RFI) at SWMU 55.

Perform corrective measure implementation (CMI) at SWMUs 53, 64, and at AOCs 18, 20, 22.

Conduct LTM at SWMUs 11, 33, 35, 41, 48, 50, and at AOC 1.

CR

Prior Year Progress: No activity. All compliance-related (CR) sites are new, and have been added to the Army Environmental Database-Restoration (AEDB-R) in 2013.

Future Plan of Action: Perform RFI and CMI at SWMU 69.

5-Year / Periodic Review Summary

5-Year / Periodic Review Summary

Status	Begin Date	End Date	End FY
Complete	200310	200409	2004
Planned	201510	201609	2016

Last Completed 5-Year / Periodic Review Details

Associated ROD/DD Name	Sites
SAAP-013 & 027	SAAP-013, SAAP-027
SAAP-041	SAAP-041
SAAP-050	SAAP-050

Results Monitoring is still picking up elevated levels of contaminants above risk levels.

Actions Continue to monitor until contaminants are below risk levels.

Plans Continue to monitor until contaminants are below risk levels.

Recommendations and Implementation Plans:
N/A

Parcel Summary

Summary of Parcel Prioritization and Transfer Strategy

Parcel Name: **All**

Parcel Size: 9,065.00

Associated Sites: SAAP-045, SAAP-040, SAAP-050, SAAP-019, SAAP-057, SAAP-110, SAAP-021, SAAP-016, SAAP-101, SAAP-002, SAAP-031, SAAP-033, SAAP-036, SAAP-037, SAAP-041, SAAP-015, SAAP-038, SAAP-039, SAAP-053, SAAP-035, SAAP-043, SAAP-058, SAAP-115, SAAP-047, SAAP-011, SAAP-048, SAAP-124, SAAP-112, SAAP-059, SAAP-051, SAAP-119, SAAP-120, SAAP-122, SAAP-114, SAAP-118, SAAP-121, SAAP-063, SAAP-005, SAAP-027, SAAP-065, SAAP-024, SAAP-007, SAAP-054, SAAP-105, SAAP-010, SAAP-003, SAAP-066, SAAP-111, SAAP-026, SAAP-064, SAAP-046, SAAP-014, SAAP-018, SAAP-020, SAAP-030, SAAP-004, SAAP-006, SAAP-008, SAAP-009, SAAP-012, SAAP-025, SAAP-013, SAAP-017, SAAP-116, SAAP-117, SAAP-123, SAAP-067

Transfer Date: 200508

Current Land Use: Other (Mixed Use)

Future Land Use: Other (Mixed Use)

Encumbrances: N/A

Leases/Permits/Licenses: 20050815

Transfer Strategy: Special Legislation

Recipient Organization: Sunflower Redevelopment, LLC.

Other Issues Affecting Transfer: N/A

SUNFLOWER ARMY AMMUNITION PLANT

Non-BRAC Excess
Installation Restoration Program

IRP Summary

Installation Total Army Environmental Database-Restoration (AEDB-R) Sites/Closeout Sites Count: 88/9

Installation Site Types with Future and/or Underway Phases

3 Above Ground Storage Tank
(SAAP-044, SAAP-065, SAAP-108)

4 Burn Area
(SAAP-021, SAAP-022, SAAP-053, SAAP-064)

1 Chemical Disposal
(SAAP-067)

2 Contaminated Buildings
(SAAP-059, SAAP-117)

2 Contaminated Fill
(SAAP-123, SAAP-124)

2 Contaminated Ground Water
(SAAP-048, SAAP-101)

3 Contaminated Sediments
(SAAP-026, SAAP-039, SAAP-047)

6 Contaminated Soil Piles
(SAAP-057, SAAP-115, SAAP-118, SAAP-119, SAAP-120, SAAP-121)

1 Disposal Pit/Dry Well
(SAAP-054)

6 Drainage Ditch
(SAAP-010, SAAP-017, SAAP-025, SAAP-033, SAAP-066, SAAP-106)

1 Firing Range
(SAAP-105)

1 Incinerator
(SAAP-046)

5 Landfill
(SAAP-018, SAAP-019, SAAP-040, SAAP-041, SAAP-042)

2 Maintenance Yard
(SAAP-058, SAAP-122)

1 Oil Water Separator
(SAAP-038)

2 POL (Petroleum/Lubricants) Lines
(SAAP-107, SAAP-109)

1 Pesticide Shop
(SAAP-030)

1 Sewage Treatment Plant
(SAAP-003)

4 Spill Site Area
(SAAP-024, SAAP-045, SAAP-063, SAAP-102)

6 Storage Area
(SAAP-015, SAAP-016, SAAP-043, SAAP-051, SAAP-062, SAAP-110)

9 Surface Disposal Area
(SAAP-014, SAAP-032, SAAP-036, SAAP-037, SAAP-050, SAAP-052, SAAP-111, SAAP-112, SAAP-116)

14 Surface Impoundment/Lagoon
(SAAP-002, SAAP-004, SAAP-006, SAAP-008, SAAP-009, SAAP-011, SAAP-012, SAAP-013, SAAP-020, SAAP-027, SAAP-031, SAAP-034, SAAP-035, SAAP-114)

2 Waste Treatment Plant
(SAAP-005, SAAP-007)

Most Widespread Contaminants of Concern

Asbestos, Dioxins/Dibenzofurans, Explosives, Herbicides, Lead Based Paint, Metals, Munitions and explosives of concern (MEC), Munitions constituents (MC), Nitrate/Nitrite, Pesticides, Petroleum, Oil and Lubricants (POL), Polychlorinated Biphenyls

(PCB), Polycyclic Aromatic Hydrocarbons (PAH), Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern

Groundwater, Sediment, Soil, Surface Water

Completed Remedial Actions (Interim Remedial Actions / Final Remedial Actions (IRA/FRA))

Site ID	Site Name	Action	Remedy	FY	Cost
SAAP-050	Disposal Site East of SWMU 1	IRA	WASTE REMOVAL - SOLIDS (NON-SOILS)	1997	TBD
SAAP-013	South Acid Area LWTP Evap. Lagoons	IRA	BIOREMEDITATION - IN SITU	1999	TBD
SAAP-027	NQ Area SAC & LWTP Evap. Lagoons	IRA	BIOREMEDITATION - IN SITU	1999	TBD
SAAP-041	Calcium Carbonate Cake Landfill	FRA	CAPPING	1999	TBD
SAAP-047	Nitroguanidine Area (25) Sumps	IRA	CAPPING	1999	TBD
SAAP-050	Disposal Site East of SWMU 1	IRA	WASTE REMOVAL - SOLIDS (NON-SOILS)	1999	TBD
SAAP-010	F-Line Area Ditches	IRA	WASTE REMOVAL - SOILS	2001	TBD
SAAP-011	F-Line Area Settling Ponds	FRA	WASTE REMOVAL - SLUDGES	2001	TBD
SAAP-018	Old/New Sanitary Landfill	IRA	WASTE REMOVAL - SOILS	2003	TBD
SAAP-033	Paste Area Half Tanks & Ditches	IRA	WASTE REMOVAL - SOILS	2003	TBD
SAAP-034	Five Corners Settling Ponds	IRA	WASTE REMOVAL - SOILS	2003	TBD
SAAP-035	Nitroglycerine Area Settling Ponds	IRA	WASTE REMOVAL - SOILS	2003	TBD
SAAP-032	Lead Decon. and Recovery Unit	IRA	WASTE REMOVAL - SOILS	2004	TBD
PBC Sunflower	Site Wide GFPR	FRA	OTHER	2008	TBD
SAAP-001	Classification Yard	IRA	REMOVAL	2008	TBD
SAAP-030	Pesticide Handling Area	IRA	WASTE REMOVAL - SOILS	2009	TBD
SAAP-036	N-Line Area	IRA	WASTE REMOVAL - SOILS	2011	TBD
SAAP-111	Forced Air Dryers	IRA	WASTE REMOVAL - SOILS	2011	TBD

Duration of IRP

Year of IRP Inception: 197907

Estimated Date for Remedy-In-Place (RIP)/Response Complete (RC): 201908/204308

Date of IRP completion including Long Term Management (LTM): 204608

IRP Contamination Assessment

Contamination Assessment Overview

Groundwater underlying SFAAP has been shown to be contaminated with nitrates, SVOCs, VOCs, POLs, metals, and pesticides. This groundwater is not used as a source for drinking water. Currently, there is a deed restriction against drilling wells for potable water.

There are six IRP sites which include 10 landfills and/or cells. The contents of the abandoned landfills are believed to be solid waste, incinerator ash, asbestos, and/or construction/demolition debris. Typical operation activities at the landfills included the trench and area methods. In the trench method, soil is excavated to create a trench, the wastes are compacted into the trench, and the excavated soil is used to cover the waste. The maximum depths of disposal trenches were usually 15 feet below land surface. Currently, there is a deed restriction against any ground-disturbing activity that would compromise the integrity of landfill caps.

Nitrocellulose (NC), nitroglycerin (NG), and nitroguanidine (NQ) were the explosives produced at SFAAP as the main ingredients in various propellant formulations. Nitric acid and sulfuric acid were also produced and recycled at SFAAP. These acids were used to produce the explosives. These acids mobilized and concentrated any metals to which they were exposed. Nitrates are also found as a result of the nitric acid and the nitrated compounds produced from the nitric acid.

Propellants produced at SFAAP included single, double and triple base solvent propellant, and double base solventless propellant. The solvents used in solvent propellant were alcohol, ether and acetone. Water was used as the mixing agent in solventless propellant. Burn modifiers and stabilizers included leaded compounds, phthalates, waxes and diphenylamines. The use of base explosives, solvents, burn modifiers and stabilizers resulted in contamination by NC, NG, NQ, lead and phthalates.

Diesel fuel, gasoline, hydraulic oil and motor oil storage, use, and accidental releases (except diesel fuel used to initiate building burns) resulted in contamination by POLs, total petroleum hydrocarbons (TPHs), SVOCs and VOCs.

Intentional open burning of explosive buildings with asbestos, lead lined floors and leaded equipment in place resulted in contamination by asbestos and lead.

Certain areas were designated for open burning explosives, explosive contaminated material, used oil/solvents, or building demolition debris. Results of these multiple burns resulted in contamination by dioxins, metals, SVOCs, VOCs, and asbestos.

Cleanup Exit Strategy

In order for SFAAP to get NFA approved by the regulators many sites require additional investigation and some sites require an initial investigation. After soil contamination is remediated the contaminated groundwater will undergo monitored natural attenuation (MNA). Specifics can be found in cleanup exit strategies for each site.

IRP Previous Studies

	Title	Author	Date
1974			
	Water Quality Monitoring, Consultation No. 24-044-74/75, Sunflower AAP, 11-15 February 1974	U.S. Army Environmental Hygiene Agency	FEB-1974
	Preliminary Environmental Survey for SFAAP	Aberdeen Proving Ground, MD and Dugway Proving Ground, UT	AUG-1974
1976			
	Aquatic Ecological Surveys at SFAAP	US Army, Edgewood Arsenal	AUG-1976
1977			
	Pollution Status Report - SFAAP	Picatinny Arsenal, NJ	JAN-1977
	Environmental Impact Assessment of NC Acid Wastewater Treatment Facility	Hercules	AUG-1977
	Environmental Impact Assessment of SFAAP Environmental Hazards from Activating Inactive Facilities	Hercules	NOV-1977
1978			
	Water Quality Biological Study No. 32-24-0134-79, Sunflower AAP, 10-21 July 1978.	U.S. Army Environmental Hygiene Agency	JUL-1978
	Environmental Assessment/Master Plan for SFAAP	Hercules	SEP-1978
	Environmental Impact Assessment Statement (Revised)	Hercules	DEC-1978
1979			
	Army Pollution Abatement Program Feasibility Study for Acid Waste Treatment Area, SFAAP	Clark-Dietz Eng, Inc.	MAY-1979
	Water Management Study of the Nitroguanidine Production Facility - SFAAP	Aberdeen Proving Ground, MD	JUL-1979
	Ambient Air Quality Impact Analysis, Nitroguanidine Facility, Sunflower AAP, June-November 1979.	U.S. Army Environmental Hygiene Agency	NOV-1979
1980			
	Installation Assessment of Sunflower AAP, Report No. 163.	U.S. Army Toxic and Hazardous Materials Agency	MAR-1980
	Water Quality Monitoring Consultation (WM) No. 32-66-0141-80, Sunflower AAP, 21-25 July 1980.	U.S. Army Environmental Hygiene Agency	JUL-1980
	Army Pollution Abatement Program Study No. D-1473-W, Landfill Disposal Study, Sunflower AAP, September 1978-September 1980.	U.S. Army Environmental Hygiene Agency	SEP-1980
	Hazardous Waste Management Survey No. 39-26-0131-82, Sunflower AAP, 18-21 November 1980.	U.S. Army Environmental Hygiene Agency	NOV-1980
	Acoustical Engineering Noise Reduction Special Study No.51-34-0457-81, Ball Mill and Boiler House Noise, Sunflower AAP, 1-4 December 1980.	U.S. Army Environmental Hygiene Agency	DEC-1980
1981			
	Landfill Disposal Study # D-1473-W, SFAAP (Sep 1978 - Sep 1980)	U.S. Army Environmental Hygiene Agency	MAR-1981
1982			
	Water Quality Engineering Consultation No. 32-24-0340-83, Sunflower AAP, 1-5 February 1982.	U.S. Army Environmental Hygiene Agency	FEB-1982
	Potable/Recreational Water Quality Survey No. 31-66-0141-83, Sunflower AAP, 20-24 September 1982.	U.S. Army Environmental Hygiene Agency	SEP-1982
	Phase I Land Treatment Feasibility Study No. 32-24-0410-83, Sunflower AAP, December 1982.	U.S. Army Environmental Hygiene Agency	DEC-1982

IRP Previous Studies

	Title	Author	Date
1983			
	Phase 2, Hazardous Waste Management Special Study No. 37-26-0147-84, DARCOM Open-Burning/Open-Detonation Grounds Evaluation, Sunflower AAP, 9-19 May 1983.	U.S. Army Environmental Hygiene Agency	MAY-1983
	Alternative Methods of Fines Removal from Coal Pile Run-Off at SFAAP	Eugene A. Hickock & Associates	OCT-1983
1984			
	Land Treatment Feasibility Study No. 32-24-0419-84, Sunflower AAP, 9-13 April 1984.	U.S. Army Environmental Hygiene Agency	APR-1984
1985			
	Archaeological Overview and Management Plan for SFAAP, Johnson County, KS	Nickens and Associates for Army and National Parks Service, US Dept of Interior	JAN-1985
	Exposure Information Report Powerhouse Industrial Waste Treatment Lagoon, USAEHA Project No. 37-26-1342-86.	U.S. Army Environmental Hygiene Agency	JAN-1985
	Hazardous Waste Study No. 37-26-0710-86, Investigation of Possible Soil Contamination from Propellant and Explosive Production.	U.S. Army Environmental Hygiene Agency	JAN-1985
	NQ Wastewater Pollution Control Engineering Study	Hercules	FEB-1985
	Hazardous Waste Study No. 37-26-0710-86, Investigation of Possible Soil Contamination from Propellant and Explosive Production, 22 October - 8 November 1985.	U.S. Army Environmental Hygiene Agency	OCT-1985
	Hazardous Waste Study No. 37-26-0709-87, Investigation of Pond and Ditch Sediments, Sunflower AAP, 21 October - 8 November 1985.	U.S. Army Environmental Hygiene Agency	OCT-1985
1986			
	Biological Treatment of SFAAP Wastewater Proposed Pilot Test Program	PolyBac Corp.	JAN-1986
	Environmental Risk Identification and Assessment of Nitroguanidine Manufacturing at SFAAP	U.S. Army - SFAAP	FEB-1986
	Short-Term Extension of Wastewater Lagoons Life at SFAAP	Arthur D. Little, Inc. for U.S. Army Toxic and Hazardous Materials Agency	MAY-1986
	Wastewater Hazards Analysis Assessment of SFAAP Nitroguanidine Wastewater GAC/IE Pilot Plant	Arthur D. Little, Inc. for U.S. Army Toxic and Hazardous Materials Agency	MAY-1986
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1987			
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	Evaluation of the Suitability of the River Water Treatment Plant Lagoons for Treating NQ Wastewater	U.S. Army - SFAAP	MAY-1987
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	Federal Facilities Compliance Agreement Final Engineering Report Between Army/SFAAP and EPA	U.S. Army and USEPA	JUN-1987
	Ground-Water Contamination Survey No. 38-26-0856-89, Final Report, Evaluation of Solid Waste Management Units, Sunflower AAP, 21-25 September 1987.	US Army Environmental Hygiene Agency	SEP-1987
	Solid Waste Disposal Study # 38-26-0824-88, Landfill Site Selection - SFAAP (18-21 May and 15-20 Jun 87)	US Army Environmental Hygiene Agency	DEC-1987
1988			
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	Asbestos Survey at SFAAP	Foster-Wheeler	JUL-1988
	Report of an Environmental Baseline Study, Koch Sulfur Products Company	Wilson and Company	NOV-1988
1989			
	Preliminary Endangerment Assessment (Draft) Task Order No. 12	Dames and Moore	JAN-1989
	US Army Response to Clearview City Environmental Screening by Environmental Audit Inc., Crestwood, KS	U.S. Army - SFAAP	MAY-1989
	Remedial Investigation Findings for SFAAP	U.S. Army Toxic and Hazardous Materials Agency	AUG-1989
	Remedial Investigation Report for SFAAP	Dames and Moore	SEP-1989
	Investigation and Evaluation of Underground Storage Tanks, SFAAP	U.S. Army Corps of Engineers - Omaha District	SEP-1989
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1991			
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	Report of Environmental Compliance Program Review at SFAAP	U.S. Army Materiel Command - Installation & Services Activity	MAY-1992
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	Preliminary Assessment Screening, Koch Sulfur Products Company	SCS Engineers	SEP-1992
1993			
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	Kansas State Proposal for Development of a Horticulture Forestry Research/Education Center on Specific Lands on SFAAP	Kansas State University	AUG-1993
	Memorandum from J.C. Betteken, regarding the Depainting Sand Debris Found Non-Hazardous	Hercules	AUG-1993
	Groundwater Quality Consultation- Nitroguanidine Production	U.S. Army Environmental Hygiene Agency	AUG-1993
1994			
	Environmental Assessment for SFAAP Operations and Maintenance Activities	Hercules	JAN-1994
	Analytical Data from Kansas University Medical Center Landfill Upgradient Monitoring Wells	University of Kansas Medical Center Safety Office	MAR-1994
	General Operating Procedure - Asbestos Materials Handling/Disposal	Hercules	JUN-1994
1995			
	Sub-surface Investigation of Proposed Lease Property	Koch Sulfur Products	JAN-1995
	Initial Public Health Assessment	Agency for Toxic Substances and Disease Registry	JAN-1995
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	RCRA General RFI QCSR for SFAAP (Volume I)	Law	AUG-1995
	Benthic Macroinvertebrate Survey - Final Report, RFI	Law	SEP-1995
	Annual Report - Army Radon Reduction Program Implementation Progress.	Hercules	OCT-1995
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	Site Summary of SFAAP	Agency for Toxic Substances and Disease Registry	DEC-1995

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	Receiving Water Biological Study No. 32-24-1174-94, Environmental Sampling of Robert¿s Lake, SFAAP	U.S. Army Environmental Hygiene Agency	MAR-1996
	Layaway of Industrial Facilities (LIF) Project 5968612 - Disposal of Polychlorinated Biphenyl Contaminated Transformers SFAAP	U.S. Army - SFAAP	MAY-1996
	Risk Analysis and Environmental Stabilization Plan for Excess Personal Property (SFAAP)	Plexus Scientific	JUL-1996
	SFAAP Environmental Compliance Audit	Huntsville District Corps of Engineers for U.S. Army Materiel Command	OCT-1996
	Background Investigation Report and QCSR for Ecological Risk Assessment, Surface Water/Sediment Sampling and De Soto Park Sampling	Law	NOV-1996
	Background Investigation Report and QCSR	Law	NOV-1996
1997			
	Community Relations Plan and Community Relations Plan Addendum for the Non-Time Critical Removal Action of Explosives-Contaminated Buildings, SFAAP	Burns & McDonnell	JAN-1997
	Community Relations Plan and Addenda	Burns & McDonnell	JAN-1997
	RFI Report for SFAAP - General	Law	FEB-1997
	RFI Report and QCSR Addendum for SWMU 50 - Disposal Site East of Classification Yard	Law	FEB-1997
	RFI Report and QCSR Addendum for SWMUs 10 - F-Line Ditches and 11 - F-Line Settling Ponds	Law	MAR-1997
	RFI Report Addendum and QCSR for SWMUs 22 - Old Explosive Waste Burning Ground and 32 - Lead Decontamination and Recovery Unit	Law	MAR-1997
	SFAAP, First Non-Time Critical Burn, 13 February 1997, Aerial Plume Emissions Measurement Report	Envirovisions, Inc.	APR-1997
	RFI Report and QCSR Addendum for SWMU 14 - Rocket Static Test Area	Law	APR-1997
	RFI Report Addendum and QCSR for SWMU 21 - Contaminated Material Burning Area	Law	MAY-1997
	RFI Report Addendum and QCSR for SWMUs 18 - Old/New Sanitary Landfills and 19 - Ash Landfills	Law	JUN-1997
	RFI Report Addendum and QCSR for SWMU 51 - Battery Handling Area	Burns & McDonnell	JUN-1997
	Groundwater Monitoring Report for the former Underground Storage Tank Site at the N-Line Jeep and Trailer Shop, Building 6866	Hercules	DEC-1997
	Environmental Baseline Study - Transfer of SFAAP to US Army Corps of Engineers	U.S. Army Corps of Engineers	DEC-1997
1998			
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	Hazardous and Medical Waste Study No. 37-EF-9063-99, Relative Risk Site Evaluation - SWMUs 53 and 54	U.S. Army Center for Health Promotion and Preventive Medicine	NOV-1998
1999			
	Environmental Assessment Regarding GSA Disposal of SFAAP	For GSA by Louis Berger & Assoc and Dames & Moore	FEB-1999
	Corrective Measures Study - SWMUs 10/11 and 22/32	Burns & McDonnell	FEB-1999
	RFI Report Addendum and QCSR for SWMU 1 - Classification Yard	Law	FEB-1999
	Facility Investigation and Final QCSR Addendum - SWMUs 4 - Pond A and 5 - Acid Sewage Disposal Plant	Law	MAR-1999
	Decision Logic Criteria for Environmental Stabilization Plan (ESP) Burns - Buildings with Asbestos-Containing Materials (ACM) - 1999	Alliant Tech Systems	MAR-1999
	RFI Report Addendum and QCSR for SWMU 24 - Nitroglycerine Area	Law	MAR-1999
	RFI Report Addendum and QCSR for SWMU 3 - Main Sewage Treatment Plant	Law	MAR-1999
	Dioxin Background Study Report	EPA/Tetra Tech	APR-1999
	RFI Report Addendum and QCSR for SWMU 13 - South Acid Area LWTP and Evaporative Lagoons	Law	APR-1999
	RFI Report Addendum and QCSR for SWMU 36 - N-Line Area	Law	APR-1999
	RFI Report Addendum and QCSR for SWMU 2 - River Water Treatment Plant Lagoons	Law	MAY-1999
	RFI Report Addendum and QCSR for SWMU 27 - NQ SAC & LWTP Evaporative Lagoons	Law	MAY-1999
	RFI Report Addendum and QCSR for SWMU 31 - Contaminated Waste Processor Evaporative Lagoons	Law	MAY-1999
	RFI Report Addendum and QCSR for SWMU 47 - Nitroguanidine Area 25 Sumps	Law	MAY-1999
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	RFI Report Addendum and QCSR for SWMU 12 - Pyotts Pond	Law	MAY-1999
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	Finding of Suitability for Early Transfer (FOSET) - SFAAP	U.S. Army - SFAAP	AUG-1999
	Off-Site Well Inventory Report	Burns & McDonnell	AUG-1999
	Flocculation and Clarification Treatability Study Report - SWMUs 10 / 11	IT Corporation	NOV-1999
	Stabilization Treatability Study Report, SWMUs 10 / 11	IT Corporation	NOV-1999
2000			
	Explosives Safety Submission Ordnance, Explosives Remedial Actions - SFAAP	IT Corporation	JAN-2000
	Geology, Hydrogeology and Groundwater Quality Study	Burns & McDonnell	FEB-2000
	RFI Report Addendum and QCSR for SWMU 37 - Sandblast Area	Burns & McDonnell	MAR-2000

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2000			
	RFI Report Addendum and QCSR for SWMU 38 - Oil Separator	Burns & McDonnell	MAR-2000
	RFI Report Addendum and QCSR for SWMU 52 - Paint Bay, Bldg 542 and Tire Shop	Burns & McDonnell	MAR-2000
	RFI Report; Addendum and QCSR for SWMU 15 - Waste Storage Magazine	Burns & McDonnell	APR-2000
	RFI Report; Addendum and QCSR for SWMU 39 - South Acid Area Drainage Ditch	Burns & McDonnell	APR-2000
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	RFI Report; Addendum and QCSR for SWMU 20 - Ash Lagoons & Sludge Disposal Area	Burns & McDonnell	MAY-2000
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	RFI Report Addendum and QCSR for SWMU 44 - Tank T784	Burns & McDonnell	JUN-2000
	RFI Report Addendum and QCSR for SWMU 17 - G-Line Area Ditches	Burns & McDonnell	OCT-2000
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	RFI Report Addendum and QCSR for SWMU 49 - Road Just Southeast of the Sanitary Landfill	Burns & McDonnell	OCT-2000
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	RFI Report Addendum and QCSR for SWMU 25 - Nitrocellulose Area Ditches	Burns & McDonnell	NOV-2000
	RFI Report Addendum and QCSR for SWMU 45 - Building 9040 Calcium Cyanamide Conveyors and Storage Units	Burns & McDonnell	NOV-2000
	RFI Report Addendum and QCSR for SWMUs 41 and 42 - Calcium Carbonate Cake and Temporary Sanitary Landfills	Burns & McDonnell	NOV-2000
2001			
	Treatability Planning & Reporting Documents, SWMUs 10 & 11	IT Corporation	FEB-2001
	Project Closure Report for SWMU 50 Interim Removal, Volumes I & II	Environmental Chemical Corporation	MAR-2001
	RFI Report Addendum and QCSR for SWMU 26 - Single Base Area Wastewater Settling Pumps	Burns & McDonnell	JUN-2001
	RFI Report Addendum and QCSR for SWMU 30 - Pesticide Handling Area	Burns & McDonnell	JUN-2001
	RFI Report Addendum and QCSR for SWMUs 7, 8, and 9 - North Acid Area	Burns & McDonnell	JUN-2001
	Characterization of Explosively Contaminated Sewer Lines	MKM Engineers	AUG-2001
	Remedial Action Summary Report for SWMUs 10 & 11	IT Corporation	OCT-2001
2002			
	Grazing Study Report - Sunflower AAP, Volume I	Burns & McDonnell	JAN-2002
	Grazing Study Report - Sunflower AAP, Volume II	Burns & McDonnell	JAN-2002
	Annual Landfill Inspection Report for SWMU 50	Environmental Chemical	MAR-2002

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2002		
	Corporation	
Public Health Assessment for Sunflower AAP	Agency for Toxic Substances and Disease Registry	MAR-2002
Supplemental RFI Addendum and QCSR for SWMU 14 - the Static Rocket Test Area	Burns & McDonnel	APR-2002
Supplemental RFI Addendum and QCSR for SWMU 21 - The Contaminated Materials Burning Ground, Volume I	Burns & McDonnel	APR-2002
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Supplemental RFI Addendum and QCSR for SWMUs 33, 34, & 35 - Half Tanks and Settling Ponds - Volume I	Burns & McDonnell	APR-2002
Supplemental RFI Addendum and QCSR for SWMUs 33, 34, & 35 - Half Tanks and Settling Ponds - Volume II	Burns & McDonnell	APR-2002
Lead Analysis Project for SWMUs 32, 33, 34, and 35 (File)	IT Corporation	MAY-2002
2003		
QCSR May-June 2003 Sampling Report	U.S. Army Corps of Engineers	JUL-2003
QCSR for Initial Sampling Event for SWMUs 13, 27, and 41	Environmental Chemical Corporation	AUG-2003
Interim Remedial Action Report for SWMUs 18, 32, 33, 34, and 35	Shaw Environmental	SEP-2003
Data Summary Report for SWMUs 13, 27, and 48, May 2002 Initial Sampling Event and Fall 2002 Subsurface Investigation	Environmental Chemical Corporation	SEP-2003
LTM Report for SWMUs 11 and 41	Environmental Chemical Corporation	SEP-2003
QCSR and Subsurface Investigation for SWMUs 11, 13, 27, 41, and 48	Environmental Chemical Corporation	SEP-2003
Annual Waste Disposal Area Inspection for SWMU 50	U.S. Army Corps of Engineers	OCT-2003
QCSR September 2003 Sampling Event	U.S. Army Corps of Engineers	OCT-2003
USACHPPM Relative Risk Site Evaluations for SWMUs 56 - 67, and AOCs 1 - 22	U.S. Army Center for Health Promotion and Preventive Medicine	NOV-2003
2004		
LTM Report and QCSRs SWMU 11	U.S. Army Corps of Engineers	JAN-2004
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Engineering Evaluation and Cost Analysis for On-Site and Off-Site Disposal of Nonhazardous Contaminated Soils at SFAAP (CAMU Study)	Shaw Environmental	JUN-2004
LTM Report and QCSRs SWMUs 33 and 34 and SWMUs 33 and 35	U.S. Army Corps of Engineers	JUL-2004
LTM Report SWMUs 33and 34 And SWMUs 33 and 35 3003	U.S. Army Corps of Engineers	JUL-2004
QCSR SWMU 11,33 and 35 June 2004 Sampling Event	U.S. Army Corps of Engineers	AUG-2004
Corrective Measures Study for SWMU 21	Shaw Environmental	NOV-2004

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2004			
	Annual Waste Disposal Area Inspection for SWMU 50	U.S. Army Corps of Engineers	NOV-2004
	QCSR September 2004 Sampling Event for SWMUs 11, 33 and 35	U.S. Army Corps of Engineers	NOV-2004
	Additional Characterization Investigation Report and Corrective Measures Work Plan, SWMU 10 - F-Line Uplands Building Foundations, Old Mechanized Roll Area, and New Mechanized Roll Area	Shaw Environmental	DEC-2004
2005			
	RFI Report Addendum and QCSR for SWMU 52 - Paint Bay, Building 542 and Tire Shop	Shaw Environmental	FEB-2005
	RFI Report Addendum and QCSR 20 - Ash Lagoons	Shaw Environmental	FEB-2005
	Final Finding of Suitability for Early Transfer of all of SFAAP	U.S. Army - SFAAP	FEB-2005
	Annual Waste Disposal Areas Inspection for SWMU 50	Shaw Environmental	MAR-2005
	Volume II Investigation Report, Corrective Measures Work Plan and QCSR for SWMUs 60 and 61, and AOCs 3 and 13	Shaw Environmental	APR-2005
	Volume I Investigation Report, Corrective Measures Work Plan and QCSR for SWMUs 60 and 61, and AOCs 3 and 13	Shaw Environmental	APR-2005
	Supplemental Investigation Report and QCSR for SWMU 14 - Static Rocket Test Area	Shaw Environmental	APR-2005
	RFI Report Addendum and QCSR for SWMU 44 -Tank T784	Shaw Environmental	JUN-2005
	RFI Report Addendum and QCSR for SWMU 1 - Classification Yard	Shaw Environmental	JUN-2005
	Sitewide Stabilization Treatability Study Report	Shaw Environmental	JUN-2005
	Relative Risk Site Evaluation AOCs 1, 18,19,20,21 and SWMU 66	U.S. Army Corps of Engineers	JUL-2005
	Explosive Safety Assessment Report	Shaw Environmental	AUG-2005
	RFI Report Addendum and QCSR for SWMU 45 - Bldg 9040 and Conveyors/Storage Units	Shaw Environmental	AUG-2005
	RFI Report Addendum and QCSR for SWMU 38 - Oil Separator	Shaw Environmental	SEP-2005
	RFI Report Addendum and QCSR for SWMU 39 - South Acid Drainage Ditches	Shaw Environmental	SEP-2005
	FI Report Addendum and QCSR for SWMU 3 - Main Sewage Treatment Plant	Shaw Environmental	OCT-2005
2006			
	Corrective Measures Completion Report for SWMU 22 - Old Explosive Waste Burning Ground	Shaw Environmental	JAN-2006
	Five-year Review Report	U.S. Army Corps of Engineers	MAR-2006
	RFI Report and QCSR for SWMU 53, Burn and Debris Area North of Sewage Treatment Plant	Shaw Environmental	MAY-2006
	LTM Report and QCSR for SWMU 41, Calcium Carbonate Cake Landfill	Shaw Environmental	MAY-2006
	RFI Report Addendum and QCSR for SWMU 18, Old and New Sanitary Landfills	Shaw Environmental	MAY-2006
	Corrective Measures Completion Report, SWMU 60, Old Photographic Laboratory and AOC 13, Warehouses	Shaw Environmental	MAY-2006

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2006			
	8073-1 through 8037- 8		
	RFI Report Addendum and QCSR for SWMU 25, Nitrocellulose Area Ditches	Shaw Environmental	JUN-2006
	Data Submittal For Groundwater Operable Unit No. 1	Shaw Environmental	AUG-2006
	RFI Report and QCSR for the Stream Study - SWMU 66 Shaw Environmental	Shaw Environmental	AUG-2006
	RCRA Permit Application for Staging Piles at SWMUs 22/32	Tetra Tech	DEC-2006
2007			
	LTM Report for SWMUs 41, 42 and 48	Tetra Tech	MAY-2007
	Focused Corrective Measures Study for SWMU 1 - Classification Yard	Tetra Tech	JUL-2007
	PCB Sites Cleanup Report	Shaw Environmental	SEP-2007
	CMS/CMS Work Plan for SWMU 53 Soils Burn and Debris Area North of the STP	Tetra Tech	OCT-2007
	Coal and/or Coal Fines Removal at SWMU 1 - Classification Yard	Tetra Tech	OCT-2007
2008			
	Annual Waste Disposal Areas Inspection for SWMU 50	Tetra Tech	MAR-2008
	LTM Report for AOC 1 - Monitoring Well West of Old Administration Building	Tetra Tech	APR-2008
	LTM Report for 2008 for SWMUs 11, 33, 34, and 35	Tetra Tech	MAY-2008
	LTM Report for 2007 for SWMU 56	Tetra Tech	MAY-2008
2009			
	Annual Waste Disposal Areas Inspection for SWMU 50	Tetra Tech	JUN-2009
2010			
	Addendum to RFI Report for SWMU 61 - Environmental Laboratory Bldg 232 [Groundwater]	Tetra Tech	JAN-2010
	Annual Waste Disposal Areas Inspection for SWMU 50	Tetra Tech	APR-2010
	LTM Report for 2008 & 2009 for SWMUs 11, 33, 34, and 35	Tetra Tech	JUN-2010
	LTM Report for 2008 & 2009 for SWMUs 41, 42 and 48	Tetra Tech	JUN-2010
	CMS for Groundwater for SWMU 21 - Contaminated Materials Burning Ground	Tetra Tech	AUG-2010
	RFI Report For Soil And Groundwater for AOC 4 - Disposal Area Southeast of STP	Tetra Tech	SEP-2010
	LTM Report for 2008 & 2009 for SWMU 56	Tetra Tech	OCT-2010
	LTM Report for 2010 for SWMUs 41, 42 and 48	Tetra Tech	DEC-2010
2011			
	CMS for Groundwater for SWMU 1 - Classification Yard	Tetra Tech	MAR-2011
	LTM Report for 2010 for SWMUs 11, 33, 34, and 35	Tetra Tech	MAR-2011
	Annual Waste Disposal Areas Inspection for SWMU 50	Tetra Tech	MAY-2011

SUNFLOWER ARMY AMMUNITION PLANT

Non-BRAC Excess

Installation Restoration Program
Site Descriptions

Site ID: SAAP-002
Site Name: River Water Treatment Plant Lagoons
Alias: SWMU 2

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: MEDIUM

Contaminants of Concern: Explosives, Metals

Media of Concern: Sediment, Soil

Phases	Start	End
RFA	197907	199009
CS	199408	199805
RFI/CMS	199611	201108
DES	201410	201412
CMI(C)	201501	201508
LTM	201510	202008

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises 19 acres in the northeast portion of the installation. This area was used as the River Water Treatment Plant (RWTP) which was built in 1942 and started operations in 1943. Water from the Kansas River was treated by lime addition, sedimentation, carbon filtration and chlorination. Two unlined lagoons were constructed south of the plant (upper lagoon 9.5M gal, lower lagoon 1.5M gal). Lime sludge was flushed from the RWTP flocculation basins into the lagoons. Water treatment operations at the RWTP ceased in 1971, thus eliminating the effluent of lime sludge from the RWTP into the lagoons. In the late 1970s, because of the start up of NQ production, the lagoons received about 200,000 gallons per day of discharge from the NQ Area. This wastewater included discharges from tank T784 (SWMU 44) which stored noncontact cooling water, steam condensate, cooling tower blowdown, and ammonia stripper discharge from the NQ production process. The RWTP was leased to a private firm for commercial aquaculture purposes in 1998. The lease was terminated in September 2001.

The May 1999 RFI results indicated the need for additional groundwater and sediment sampling. The March 2002 RFI data indicated elevated levels of arsenic in deep subsurface soils at the bedrock interface.

A draft revised baseline risk assessment for surface and subsurface soil at SWMU 2 was prepared in February 2007, which KDHE rejected. KDHE stated that the consent order (CO) between KDHE and SRL did not allow SRL to use a risk assessment in order to "risk away" a cleanup. KDHE stated that SRL is required per the CO to use the cleanup levels in the Tier 2 Risk-Based Standards for KDHE.

A wastewater lagoon closure and verification sampling work plan was prepared in March 2011, which is awaiting approval by KDHE.

The RFI is expected to demonstrate unacceptable risk at the site. The corrective measure will consist of excavation of accumulated sludge in the lagoons and regrading the former lagoons to drain. Excavation will also include the lime sludge dredged between 1943 and 1971 from the lagoons and deposited on the slopes above the lagoons. The lime sludge will not require treatment before disposal.

Prior to pond dewatering and sludge excavations there will be excavation of a 435 linear feet ditch to divert the stream north of the lagoons. This will be a permanent diversion ditch, lined with riprap. The diversion ditch will be 12 feet deep on the west end and six feet deep on the east end, with sloped sides of one-to-one. The excavated soil will be used to build a permanent diversion dam.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil/sludge is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed the area where the stockpiles

were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above target media cleanup levels (TMCLs).

LTM for groundwater and a pond closure report will follow. LTM involves sampling four wells twice a year for five years.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and land use controls (LUCs) in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-003
Site Name: Sewage Treatment Plant Drying Beds
Alias: SWMU 3

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: HIGH

Contaminants of Concern: Metals, Pesticides, Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA	197907	199009
CS	199408	199805
RFI/CMS	199511	201408
CMI(C)	200802	201408

RIP Date: N/A

RC Date: 201408

SITE DESCRIPTION

This site comprises 10 acres in the northeast portion of the installation. This area was used as the main sewage treatment plant (STP). The STP was built in 1942. The STP stopped receiving human waste in 2002. The plant treated sanitary wastewater from the installation. Following treatment, water from the plant was discharged into Kill Creek. During the 1950s and 1960s, solids (sludge) from the STP were placed in drying beds east of the Imhoff tank. The digester was last emptied in 1974. Wastewater from various non-explosive production facilities and laboratories, including a photographic laboratory, processed at the plant may have contained hazardous constituents. According to a 1974 report, no chlorination was performed at the STP.

Areas of contamination were found during the initial RFI in March 1999. Further soil investigation was conducted to fully delineate the site in October 2005.

Corrective measures were conducted for the Sludge Drying Beds and the STP was decommissioned in 2008. Excavation of 4,309 tons of contaminated soil/sludge was conducted and disposed of offsite. A corrective measures completion report will be prepared. After KDHE approval of this corrective measures completion report, a statement of basis (SOB) for no further corrective action planned will be prepared.

CLEANUP/EXIT STRATEGY

Remediation at this site is complete. A corrective measures completion report will be prepared and allow for a NFA determination.

Site ID: SAAP-004
Site Name: Pond A and Sludge Disposal Area
Alias: SWMU 4

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: MEDIUM

Contaminants of Concern: Explosives, Metals, Nitrate/Nitrite, Polychlorinated Biphenyls (PCB), Semi-volatiles (SVOC)

Media of Concern: Groundwater, Sediment, Soil, Surface Water

Phases	Start	End
RFA	197907	199009
CS	199408	199805
RFI/CMS	199610	201408
DES	201410	201412
CMI(C)	201501	201508
LTM	201510	202508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises three acres in the north central portion of the installation. This area was used for the sedimentation of solids and equalization of wastewater from the NC production area prior to lime treatment and subsequent discharge to Pond B (SWMU 6). Pond A was constructed in 1942 with a surface area of 86,200 square feet, and received wastewater from NC production during periods of 1943-1946, 1951-1960 and 1965-1971. In addition, Pond A received wastes from many other areas of SFAAP, including the NQ Pilot Plant from 1980-1984. The pond now functions as part of the natural drainage system receiving storm sewer outfall from various parts of SFAAP, including drainage from the Industrial Wastewater Treatment Facility Area. Pond A receives storm water runoff from SWMU 25 (NC Ditches) and shares a geographical boundary with SWMU 5 (Acid Sewage Disposal Plant). All underground piping that is associated with the Acid Sewage Disposal Plant will be handled under SAAP-005.

The March 2000 RFI results indicated elevated levels of NC.

An RFI work plan was prepared in July 2010, which was approved by KDHE. Fieldwork was never started due to insufficient funding.

Additional RFI activities are required to complete site characterization and identify the lateral and vertical extent of contaminated sediment requiring removal in the pond, the sludge disposal area and the tributary between Ponds A and B. Two bedrock wells will be installed. Anticipated samples taken as part of the additional RFI activities include soil, sediment, surface water, and groundwater samples analyzed for RCRA Metals, antimony, cobalt, copper, hexavalent chromium, iron, manganese, nickel, thallium, explosives, NC, NG, NQ, guanidine nitrate (GN), SVOCs, VOCs, PCBs, TPH-diesel range organics (DRO), TPH-gasoline range organics (GRO), ammonia, cyanide, nitrate/nitrite, sulfate, pesticides, fluoride, chloride, pH.

Historical data were used to develop the assumptions for the remaining cleanup required. The following are the areas of contaminated soil/sludge that remain to be excavated, screened, and disposed off-site. The sediment will be blended using a powerscreen, mixing sediment with dry soils to homogenize soils, reducing the concentration of NC to levels below 10 percent per unit volume of soil. It is anticipated that the contaminated sediment will not require stabilization because it already is below toxicity characteristic leaching procedure (TCLP) for disposal at a Subtitle D Landfill.

The corrective measures assumes that Pond A will require sediment removal across the entire pond surface area. The Army assumes that this material is dispersed across the pond bottom in a fan-like pattern, thinning at the edges and deepest in the center.

Prior to sediment removal, the influent drainage will be diverted around the Pond A site perimeter to allow for dewatering and sediment drying. Once dry, the sediment will be removed using a D-9 dozer and two tracked loaders (973). Material will be placed

on the embankment to compress additional moisture from the sediment.

Post excavation confirmation samples (one per 900 square feet) will be collected after the soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed the area where the stockpiles were will be sampled one per ~285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

LTM involves sampling four wells twice a year for 10 years. Contaminants to analyze for in the groundwater samples are RCRA Metals, fluoride, manganese, nitrate/nitrite, sulfate.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-005
Site Name: Acid Sewage Disposal Plant
Alias: SWMU 5

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: MEDIUM

Contaminants of Concern: Explosives, Metals, Nitrate/Nitrite

Media of Concern: Soil

Phases	Start	End
RFA	197907	199009
CS	199408	199805
RFI/CMS	199610	201408
DES	201410	201412
CMI(C)	201501	201508
LTM	201510	202508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises one acre in the north central portion of the installation. This area was used to treat the acidic wastewater flowing into Pond A from the NC Production Area and had three periods of operation: 1943-1946, 1951-1960 and 1965-1971. The water from Pond A was diverted into the neutralization unit and pH was adjusted by adding burned lime slurry. The neutralized water and unsettled flocculent were then discharged from the unit into an underground drainage pipe which emptied into a tributary ditch to Pond B (SWMU 6). The underground piping and the initial portion of the connecting ditch to Pond B will be remediated under this site.

The March 2000 RFI results indicated elevated levels of NC.

A RFI work plan was prepared in July 2010, which was approved by KDHE. Fieldwork was never started due to insufficient funding.

RFI activities are required to delineate areas of contamination, complete site groundwater characterization, and to further define the volume of soils requiring removal. Groundwater monitoring wells will be installed. Anticipated samples taken as part of the additional RFI activities include groundwater, soil, sediment, and surface water samples analyzed for RCRA metals, antimony, cobalt, copper, hexavalent chromium, iron, manganese, nickel, thallium, explosives, NC, NG, NQ, GN, SVOCs, VOCs, PCBs TPH-DRO, TPH-GRO, ammonia, cyanide, nitrate, sulfate, pesticides, fluoride, chloride, pH.

The corrective measure consists of the excavation of the acid brick cisterns and surrounding soils, transfer piping and pond overflow area soils. The site measures approximately 300 feet by 360 feet. Soils requiring removal from around the acid brick cisterns may extend to a depth of 15 feet below ground surface, extending laterally from the sidewalls. The corrective measures include removal of underground piping and the initial headwall portion of the tributary ditch to Pond B.

Post excavation confirmation samples (one per 900 square feet) will be collected after the soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

It is anticipated that the contaminated soil will not require stabilization because it already is below TCLP for disposal at a Subtitle D Landfill.

LTM involves sampling four wells twice a year for 10 years. Contaminants to analyze for in the groundwater samples are RCRA Metals, fluoride, manganese, nitrate/nitrite, sulfate.

Site ID: SAAP-005
Site Name: Acid Sewage Disposal Plant
Alias: SWMU 5

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-006
Site Name: Pond B and Sludge Disposal Area
Alias: SWMU 6

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: MEDIUM

Contaminants of Concern: Explosives, Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Sediment, Soil, Surface Water

Phases	Start	End
RFA	197907	199009
CS	199405	199805
RFI/CMS	199611	201408
DES	201410	201412
CMI(C)	201501	201508
LTM	201510	202008

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises 38 acres in the east central portion of the installation. This area was used for sedimentation of solids from the neutralized wastewater discharged from the Acid Sewage Disposal Plant (SWMU 5). Unknown quantities of sludge were occasionally dredged from pond B and landfilled west of the pond. Pond B discharges into Kill Creek. Pond B was a farm pond constructed prior to purchase of farm land for building the installation. Pond B is an unlined impoundment situated upon limestone bedrock with a surface area of nine acres and a capacity of 16.5M gal.

The May 1999 RFI results indicated elevated levels of manganese in groundwater.

A RFI work plan was prepared in July 2010, which was approved by KDHE. Fieldwork was started but put on hold due to insufficient funds

To finish the RFI there will be subsurface soil samples for vertical delineation of contaminated soil, surface soil samples for horizontal delineation of contaminated soil, sludge disposal characterization samples, and groundwater grab samples using direct-push technology (DPT). Groundwater monitoring wells will be installed and five groundwater samples taken. Samples will be analyzed for RCRA Metals, antimony, cobalt, copper, hexavalent chromium, iron, manganese, nickel, thallium, explosives, NC, NG, NQ, GN, SVOCs, VOCs, PCBs TPH-DRO, TPH-GRO, ammonia, cyanide, nitrate/nitrite, sulfate, pesticides, fluoride, chloride, and pH.

The corrective measures assume that the entire pond will require sediment removal. Additionally, the sludge from the Sludge Disposal Area located just west of Pond B will be excavated.

Prior to soil removal, the influent contribution drainage will be diverted around Pond B to allow for dewatering and soil drying. Once dry, the sediment will be removed using a D-9 dozer and two tracked loaders (973). Material will be placed on the embankment to compress additional moisture from the soils.

It is anticipated that the contaminated sediment will not require stabilization because it already is below TCLP for disposal at a Subtitle D Landfill.

Post excavation confirmation samples (one per 900 square feet) will be collected after the soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

Site ID: SAAP-006
Site Name: Pond B and Sludge Disposal Area
Alias: SWMU 6

LTM is planned and involves sampling seven wells twice a year for five years. Contaminants to analyze for in the groundwater samples are Metals, SVOCs, NC, NG, and Pesticides.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-007
Site Name: North Acid Area - Chromate Area
Alias: SWMU 7

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: HIGH

Contaminants of Concern: Metals, Nitrate/Nitrite, Pesticides, Polycyclic Aromatic Hydrocarbons (PAH)

Media of Concern: Groundwater, Sediment, Soil, Surface Water

Phases	Start	End
RFA	197907	199201
CS	199610	199805
RFI/CMS	199807	201408
DES	201410	201412
CMI(C)	201501	201508
LTM	201510	202008

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises one acre in the north central portion of the installation. This area was used for production and recycling of nitric acid and sulfuric acid, and production of ammonia and ammonium nitrate. The Chromate Area is the location of the former cooling water treatment unit, including a cooling tower in which chromium-contaminated wastewater was reportedly generated through the use of corrosion inhibitors on the tower. Chromate liquid may have been disposed in pipes subsequently left buried in the area, and the potential is present for heavy metal contamination. When the site was dismantled in 1958, the two wastewater collection basins were left in place. In 1982 and 1983 chromium-contaminated water was removed from the basins. Water continues to accumulate in the basins.

The North Acid Area operated during World War II (1943-1946), producing nitric acid and recycling sulfuric acid. After propellant production ceased in 1946 an ammonium nitrate facility was constructed and 324M pounds of ammonium nitrate liquor were produced during the period of 1946-1948. In 1952 Food Machinery & Chemical Corporation built a Nitrogen Fixation Plant at the north end of the North Acid Area, and operated it from 1953-1954. This is the location where chromate contamination was found.

As a result of the 1998 EBS the boundary for SWMUs 7, 8, & 9 was expanded to include all of the North Acid Area. The entire Chromate Area will be covered in SWMU 7. The interim corrective measures (ICM) for the soil around explosive buildings in the North Acid Area will be covered in the AOC 23 Work Plan for SWMU 9. The non-explosive buildings, ditches, and areas away from the explosive buildings in the North Acid Area, excluding the Chromate Area, will be included in the RFI and corrective measures for SWMU 8.

The data from the 2001 RFI were determined by the regulators to be unreliable (Intertek Testing Services Data).

Therefore another RFI was initiated in 2008. The fieldwork was started but put on hold due to insufficient funds.

Finishing the RFI entails taking subsurface soil samples for vertical delineation of contaminated soil, surface soil samples for horizontal delineation of contaminated soil, and groundwater grab samples using DPT. Groundwater monitoring wells will be installed and groundwater samples will be taken.

The corrective measures are excavation of chromium contaminated soils where the cooling tower and cooling water treatment unit once stood. The area also has buried 18" pipes that must be excavated and possible chromium contamination in the soil. Excavation will be required of the surface area of the chromium, mercury, and SVOC-PAH contaminated soil around the cooling water treatment unit and other buildings in the Chromate area with soil samples exceeding industrial TMCLs. The estimated length is 600 feet of buried 18 inch cooling water pipes which contain hexavalent chromium contaminated water and sludge. The chromium contaminated liquid and liquid sludge is estimated to be 7,200 gallons. Confirmation samples will be analyzed for RCRA

Site ID: SAAP-007
Site Name: North Acid Area - Chromate Area
Alias: SWMU 7

Metals, hexavalent chromium, iron, manganese, SVOCs, VOCs, explosives, NC, NG, nitrate, sulfate, ammonia, TPH-DRO, and pH.

Excavated soils that meet Subtitle D TCLP levels will be transported and disposed offsite as nonhazardous special waste. 7,200 gallons of chromate sludge from the pipelines and other soils that do not meet Subtitle D TCLP levels will be shipped off-site for treatment and disposal at a Subtitle C landfill.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil/sludge is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

LTM is planned and involves sampling four wells twice a year for five years. Contaminants to analyze for in the groundwater samples are RCRA Metals, VOCs, and SVOCs.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-008
Site Name: N. Acid Area - Chromate Conc. Pond
Alias: SWMU 8

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: HIGH

Contaminants of Concern: Metals, Polycyclic Aromatic Hydrocarbons (PAH)

Media of Concern: Soil

Phases	Start	End
RFA	197907	199009
CS	199608	199805
RFI/CMS	200001	201508
IRA	200610	201508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises one acre in the north central portion of the installation. This area was used for production and recycling of nitric acid and sulfuric acid, and production of ammonia and ammonium nitrate. The Chromate Area is the location of the former cooling water treatment unit, including a cooling tower in which chromium-contaminated wastewater was reportedly generated through the use of corrosion inhibitors on the tower. Chromate liquid may have been disposed in pipes subsequently left buried in the area, and the potential is present for heavy metal contamination. When the site was dismantled in 1958, the two wastewater collection basins were left in place. In 1982 and 1983 chromium-contaminated water was removed from the basins. Water continues to accumulate in the basins.

The North Acid Area operated during World War II (1943-1946), producing nitric acid and recycling sulfuric acid. After propellant production ceased in 1946 an ammonium nitrate facility was constructed and 324M pounds of ammonium nitrate liquor were produced during the period of 1946-1948. In 1952 Food Machinery & Chemical Corporation built a Nitrogen Fixation Plant at the north end of the North Acid Area, and operated it from 1953-1954. This is the location where chromate contamination was found.

As a result of the 1998 EBS the boundary for SWMUs 7, 8, & 9 was expanded to include all of the North Acid Area. The entire Chromate Area will be covered in SWMU 7. The ICM for the soil around explosive buildings in the North Acid Area is covered in the AOC 23 Workplan for SWMU 9. The non-explosive buildings, ditches, and areas away from the explosive buildings in the North Acid Area, excluding the Chromate Area, will be included in the RFI and corrective measures for SWMU 8.

The data from the 2001 RFI were determined by the regulators to be unreliable (Intertek Testing Services Data). Therefore, another RFI was initiated in 2008. The fieldwork was started but put on hold due to insufficient funds.

The ICM (pre-AOC 23) involves collecting soil samples and sending to an offsite laboratory for analysis to horizontally delineate surface area of soil contamination around MEC foundations. One fixed-base laboratory sample will be collected every 30 linear around each MEC foundation. Additional samples are required for foundations that are not in exactly 30 linear feet increments. An estimated failure rate of 15 percent of these samples having contaminants above TMCLs requiring excavation then requires step out samples to horizontally delineate the surface soil contamination. Three surface samples bound each exceedance horizontally (the foundation bounds the fourth side). An estimated failure rate of five percent of the step out samples having contaminants above TMCLs requiring excavation then requires additional step out samples to horizontally delineate the surface soil contamination. Grids with TMCL exceedances will be excavated. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation.

Post excavation confirmation samples (one per 900 square feet) will be collected after the soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were will be sampled (one per 285 cy) to ensure no contamination remains above TMCLs.

Site ID: SAAP-008
Site Name: N. Acid Area - Chromate Conc. Pond
Alias: SWMU 8

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is not anticipated at this site.

Site ID: SAAP-009
Site Name: N. Acid Area - WW Treatment Lagoon
Alias: SWMU 9

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: HIGH

Contaminants of Concern: Explosives, Metals, Polycyclic Aromatic Hydrocarbons (PAH), Volatiles (VOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA	197907	199009
CS	199610	199805
RFI/CMS	200001	201408
DES	201410	201412
CMI(C)	201501	201508
LTM	201510	202008

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises one acre in the north central portion of the installation. This area was used for production and recycling of nitric acid and sulfuric acid, and production of ammonia and ammonium nitrate. The Chromate Area is the location of the former cooling water treatment unit, including a cooling tower in which chromium-contaminated wastewater was reportedly generated through the use of corrosion inhibitors on the tower. Chromate liquid may have been disposed in pipes subsequently left buried in the area, and the potential is present for heavy metal contamination. When the site was dismantled in 1958, the two wastewater collection basins were left in place. In 1982 and 1983 chromium-contaminated water was removed from the basins. Water continues to accumulate in the basins.

The North Acid Area operated during World War II (1943-1946), producing nitric acid and recycling sulfuric acid. After propellant production ceased in 1946 an ammonium nitrate facility was constructed and 324M pounds of ammonium nitrate liquor were produced during the period of 1946-1948. In 1952 Food Machinery & Chemical Corporation built a Nitrogen Fixation Plant at the north end of the North Acid Area, and operated it from 1953-1954. This is the location where chromate contamination was found.

As a result of the 1998 EBS the boundary for SWMUs 7, 8, and 9 was expanded to include all of the North Acid Area. The entire Chromate Area will be covered in SWMU 7. The ICM for the soil around explosive buildings in the North Acid Area will be covered in the AOC 23 work plan for SWMU 9. The non-explosive buildings, ditches, and areas away from the explosive buildings in the North Acid Area, excluding the Chromate Area, will be included in the RFI and corrective measures for SWMU 8.

The data from the 2001 RFI were determined by the regulators to be unreliable (Intertek Testing Services Data). Therefore another RFI was initiated in 2008. The fieldwork was started but put on hold due to insufficient funds.

To finish the RFI of the North Acid Area excluding the Chromate Area and Explosive Foundations entails taking subsurface soil samples for vertical delineation of contaminated soil, surface soil samples (stepouts) for horizontal delineation of contaminated soil, and groundwater grab samples using DPT. Groundwater monitoring wells will be installed and groundwater samples taken.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

Post excavation confirmation samples (one per 900 square feet) will be collected after the soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination

remains above TMCLs.

LTM is planned and involves sampling five wells twice a year for five years. Contaminants to analyze for in the groundwater samples are RCRA metals, VOCs, and SVOCs.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-010
Site Name: F-Line Area Ditches
Alias: SWMU 10

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: HIGH

Contaminants of Concern: Explosives, Metals, Nitrate/Nitrite, Pesticides, Petroleum, Oil and Lubricants (POL), Polycyclic Aromatic Hydrocarbons (PAH), Semi-volatiles (SVOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA	197907	199009
CS	199408	199805
RFI/CMS	199806	200410
DES	200410	200501
IRA	199905	200106
CMI(C)	200410	201408
LTM	201408	201908

RIP Date: N/A

RC Date: 201408

SITE DESCRIPTION

This site comprises 217 acres in the east central portion of the installation. This area was used for production of 2.75 inch rocket grains. This site was built in 1942 and consisted of sumps, troughs, pipes and other conveyances and ditches used for the management of wastewater from operations in the F-Line Area. F-Line included a blender house where explosive propellant was received and blended with lead salicylate; rolled into sheets; slit and wound into carpet rolls; and extruded by large hydraulic presses into solid propellant grains. Any propellant that was on the floor was washed into the drain with the wastewater. Most of the effluents were then discharged, via unlined ditches, to settling ponds and eventually to Spoon and Kill Creeks; however, one group of the ditches discharged directly to a field adjacent to Spoon Creek. The F-line ditches were located on the east side of the F-Line press houses. Occasionally, propellant solids settled in these ditches before reaching the ponds. The ditches were used periodically from 1943 to 1971.

The February 1999 RFI indicated NG in soil at concentrations that exceed USEPA's target risk range for carcinogenic risk. Lead was found at concentrations exceeding USEPA and KDHE guidance values.

The corrective measures study (CMS) and SOB were completed in February 1999 and recommended soil remediation by excavation, stabilization and disposal. As a result of the 1998 EBS the size of this site was expanded by 25 acres to a total area of 128 acres and includes 56 building foundations. A surface soil removal of 47,000 tons of contaminated soil was completed in 2001.

SAAP-106 is being handled under SAAP-010. Investigation of 10 additional acres in SAAP-010, and all of SAAP-106 was completed in 2004. A total of 4,945 tons of contaminated soil from SAAP-106 and part of SAAP-010 were excavated and disposed of in March 2005.

ICM for contaminated soil underneath explosive buildings and sewers in the F-Line was covered in the AOCs 23/24 ICM for SAAP-010. This ICM is not in the phase schedule for SAAP-010 because the funding and work was done under AOC 23/24. A total of 76,964 tons of contaminated soil from underneath explosive foundations and sewers in SAAP-010 and SAAP-106 were excavated and disposed of, and was completed in 2008. An ICM completion report is being prepared.

LTM is planned and involves installing five wells and sampling these wells once a year for five years. Contaminants to analyze for in the groundwater samples are nitrate/nitrite, nitrate, NG, lead, SVOC-phthalates, and sulfate.

CLEANUP/EXIT STRATEGY

Site ID: SAAP-010
Site Name: F-Line Area Ditches
Alias: SWMU 10

LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-011
Site Name: F-Line Area Settling Ponds
Alias: SWMU 11

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: HIGH

Contaminants of Concern: Explosives, Metals, Nitrate/Nitrite, Semi-volatiles (SVOC)

Media of Concern: Groundwater, Sediment, Soil

Phases	Start	End
RFA	197907	199009
CS	199408	199805
RFI/CMS	199601	199907
DES	199907	199908
CMI(C)	199906	200109
LTM	200110	201808

RIP Date: N/A

RC Date: 200109

SITE DESCRIPTION

This site comprises five acres in the east central portion of the installation. This area was used for settling ponds for removing explosive solids from F-Line wastewater. Wastewater from the F-Line production facilities drained into ditches, which, for the most part, led to the six F-Line Area Settling Ponds (1A, 1B, 2A, 2B, 3A, and 3B) and two Blender Ponds (4A and 4B). The six settling ponds were unlined earthen ponds equipped with stand pipes to permit settling of solids and decantation of water. The northernmost settling ponds (3A and 3B) were constructed in 1942 and abandoned in 1971. The remaining ponds were operational from 1943 to 1969. These ponds were used to settle propellant solids from wastewater generated during production of propellants. The ponds were also part of the natural drainage system, ultimately discharging into Spoon and Kill Creeks. During past operations, SFAAP occasionally removed the propellant solids which had accumulated in the ponds and burned them at the burning grounds (SAAP-022). The pond sediments were contaminated with propellant containing lead salts, phthalates, NG and NC.

The February 1999 RFI indicated NG in the soil at concentrations that exceed USEPA's target risk range for carcinogenic risk. Lead was also found at concentrations exceeding USEPA and KDHE guidance values.

The CMS and SOB was completed in February 1999 and recommended soil remediation by excavation, stabilization and disposal. Excavated and disposed of 6,750 tons of contaminated sediment and underlying soil. The CMI was completed in 2001.

LTM is underway and involves sampling seven wells twice a year for five years. Contaminants to analyze for in the groundwater samples are nitrate/nitrite, nitrate, NG, lead, SVOC-phthalates, and sulfate.

CLEANUP/EXIT STRATEGY

LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-012
Site Name: Pyotts Pond & Sludge Disposal Area
Alias: SWMU 12

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: MEDIUM

Contaminants of Concern: Metals, Pesticides, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Sediment, Soil, Surface Water

Phases	Start	End
RFA	197907	199009
CS	199408	199805
RFI/CMS	199606	201408
DES	201410	201412
CMI(C)	201501	201508
LTM	201510	202008

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises 12 acres in the east central portion of the installation. This area was used as an acidic water retention basin to regulate the pH prior to discharge off-site. Pyotts Pond is an unlined, earthen impoundment with a surface area of 1.7 acres and a capacity of 5.2M gal. The pond was constructed in 1968 to aide in pollution control. In the past it has received drainage from the South Acid Area, the Paste Mix Area, the NC Area, the Solvent Area and the NG Area. Neutralization of water entering the pond resulted in an accumulation of calcium sulfate sludge, which was periodically dredged and landfilled adjacent to the pond to the north. Effluent from the pond drains northeast to Kill Creek, and was monitored by National Pollutant Discharge Elimination System (NPDES) Outfall 004.

The May 1999 RFI results indicated elevated levels of mercury and NQ in the surface water. Groundwater contained NQ and sediments contained elevated levels of PAHs, PCBs and NC.

An RFI work plan was prepared in June 2010, which was approved by KDHE. Fieldwork was started but put on hold due to insufficient funds.

Finishing the RFI entails taking subsurface soil samples for vertical delineation of contaminated soil, surface soil samples for horizontal delineation of contaminated soil, and sludge disposal characterization samples, and groundwater grab samples using DPT. Groundwater monitoring wells will be installed and groundwater samples taken. Samples will be analyzed for RCRA metals, antimony, beryllium, cobalt, copper, hexavalent chromium, manganese, iron, nickel, vanadium, zinc, explosives, NG, NQ, NC, GN, SVOCs, VOCs, PCBs, TPH-DRO, TPH-GRO, ammonia, cyanide, nitrate/nitrite, pesticides, and sulfate.

The corrective measures assume that the entire pond will require sediment removal. Additionally, the sludge disposal areas will require excavation and disposal.

Prior to soil removal, the influent drainage will be diverted around Pyotts Pond to allow for dewatering and sediment drying. Once dry, the sediment will be removed using a D-9 dozer and two tracked loaders (973). Material will be placed on the embankment to compress additional moisture from soils.

It is anticipated that the contaminated sediment will not require stabilization because it already is below TCLP for disposal at a Subtitle D landfill.

Post excavation confirmation samples (one per 900 square feet) will be collected after the soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were will be sampled

one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

LTM is planned and involves sampling eight wells twice a year for five years. Contaminants to analyze for in the groundwater samples are RCRA metals, SVOCs, and NG.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-013
Site Name: South Acid Area LWTP Evap. Lagoons
Alias: SWMU 13

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: LOW

Contaminants of Concern: Explosives, Metals, Nitrate/Nitrite

Media of Concern: Groundwater, Sediment, Soil, Surface Water

Phases	Start	End
RFA	197907	199009
CS	199408	201508
IRA	199810	201508
LTM	201510	204508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises 32 acres in the east central portion of the installation. This area was used as evaporative lagoons for NQ production wastewater after treatment at the liquid waste treatment plant (LWTP). The LWTP consisted of five aboveground tanks: three for treating wastewater, one for slurrying lime, and one for feeding wastewater to be treated. In addition, there were four unlined, earthen cells used as evaporative lagoons associated with the LWTP. Use of the LWTP and lagoons began in 1979. Volumes of waste treated at the LWTP varied with the need of production operations. The plant treated up to 1.5 million gallons of corrosive wastewater each month. In the summer of 1986, the lagoons were reportedly nearing their effective capacity, and the wastewater from the lagoons was being applied to land within the plant boundaries.

In a letter dated March 11, 1996, KDHE approved a schedule of work for remediation of the lagoon sludge and dismantlement of the lagoons. This action partially fulfilled KDHE requirements for lagoon closure. This ICM work was completed in August 1999. Groundwater monitoring until contaminants are below risk levels will complete the closure of the lagoons. Groundwater monitoring is on hold pending completion of soil cleanup of all upgradient sites.

ICM for contaminated soil underneath explosive foundations is covered in the AOCs 23/24 ICM for SAAP-013.

The ICM (pre-AOC 23) involves collecting soil samples and sending to an offsite laboratory for analysis to horizontally delineate surface area of soil contamination around MEC foundations. One fixed-base laboratory sample will be collected every 30 linear around each MEC foundation. Additional samples are required for foundations that are not in exactly 30 linear feet increments. An estimated failure rate of 15 percent of these samples having contaminants above TMCLs requiring excavation then requires step out samples to horizontally delineate the surface soil contamination. Three surface samples bound each exceedance horizontally (the foundation bounds the fourth side). An estimated failure rate of five percent of the step out samples having contaminants above TMCLs requiring excavation then requires additional step out samples to horizontally delineate the surface soil contamination. Grids with TMCL exceedances will be excavated. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. Confirmation soil samples will be analyzed for RCRA metals, manganese, nitrate, sulfate, NQ, and GN.

Post excavation confirmation samples (one per 900 square feet) will be collected after the soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

LTM at SWMU 13 involves sampling eight wells twice a year for 10 years. Contaminants to analyze for in the groundwater samples are RCRA metals, manganese, nitrate, sulfate, NQ, and GN.

Site ID: SAAP-013
Site Name: South Acid Area LWTP Evap. Lagoons
Alias: SWMU 13

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. Excavation and disposal of contaminated soil are expected to allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-014
Site Name: Rocket Static Test Area
Alias: SWMU 14

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: HIGH

Contaminants of Concern: Explosives, Metals

Media of Concern: Groundwater, Sediment, Soil

Phases	Start	End
RFA	197907	199009
CS	199408	199805
RFI/CMS	199810	201408
IRA	200803	201510
LTM	201511	202008

RIP Date: N/A

RC Date: 201510

SITE DESCRIPTION

This site comprises seven acres in the east central portion of the installation. This area was used to ballistically test 2.75 inch rocket grains. The site includes four firing platforms. Two outdoor firing platforms are located immediately north of each of the two Rocket Static buildings.

The April 1997 and April 2002 RFI sampling indicated lead, NG and phthalates in surface soil above action levels. Lead and NG were found in the groundwater above action levels.

Additional soil and surface water sampling was completed in the April 2005 RFI to delineate the areas of contamination.

ICMs were conducted in 2008. A total of 1,847 tons of contaminated soil were excavated and disposed of.

ICMs for contaminated soil underneath explosive foundations is covered in the AOCs 23/24 ICM for SAAP-014. The work plan for AOCs 23/24 ICM at SAAP-014 was prepared in March 2011, and is awaiting approval by KDHE.

The ICMs(pre-AOC 23) involves collecting soil samples and sending to an off-site laboratory for analysis to horizontally delineate surface area of soil contamination around MEC foundations. One fixed-base laboratory sample will be collected every 30 linear around each MEC foundation. Additional samples are required for foundations that are not in exactly 30 linear feet increments. An estimated failure rate of 15 percent of these samples having contaminants above TMCLs requiring excavation then requires step out samples to horizontally delineate the surface soil contamination. Three surface samples bound each exceedance horizontally (the foundation bounds the fourth side). An estimated failure rate of 5 percent of the step out samples having contaminants above TMCLs requiring excavation then requires additional step out samples to horizontally delineate the surface soil contamination. Grids with TMCL exceedances will be excavated. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation.

Post excavation confirmation samples (one per 900 square ft) will be collected after the soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 feet from stockpile base) to ensure no contamination remains above TMCLs.

LTM is planned and involves sampling three wells twice a year for five years. Contaminants to analyze for in the groundwater samples are RCRA metals, NG, and SVOCs.

CLEANUP/EXIT STRATEGY

Site ID: SAAP-014
Site Name: Rocket Static Test Area
Alias: SWMU 14

[redacted]

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-015
Site Name: Waste Storage Magazines
Alias: SWMU 15

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: MEDIUM

Contaminants of Concern: Metals, Pesticides

Media of Concern: Sediment, Soil

Phases	Start	End
RFA	197907	199009
CS	199509	199805
RFI/CMS	200001	201408

RIP Date: N/A

RC Date: 201408

SITE DESCRIPTION

This site comprises 57 acres in the southeast portion of the installation. This area was used for RCRA permitted temporary storage of hazardous waste from 1985-2001. Before being RCRA permitted storage units these magazines were used to store produced propellant prior to shipping off-site. The buildings included in this site are: J-117, J-118, J-119, J-120, J-121, J-122, J-124, J-127, and J-128. All magazines used natural lighting to preclude accidental detonation of explosives, are secured with locking doors, and have concrete floors with secondary containment. Materials designated to be stored in each magazine included production waste from propellant manufacturing, spent solvents, and other explosive and hazardous waste.

All of the RCRA Permitted Hazardous Waste Storage Units (buildings) in SWMU 15 have completed the normal RCRA treatment, storage and disposal facility closure activities under Section I of the RCRA Part B Permit; however, KDHE demands that the applied pesticides underneath the foundation slab and directly around the outside of the foundation must be excavated and disposed before they will certify that the building are clean closed. The Army does not agree with the regulators because applied pesticides are not a Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) release and therefore no cleanup is required.

The data from the April 2000 RFI were determined by the regulators to be unreliable (Intertek Testing Services Data). Therefore another RFI was initiated in 2008. Fieldwork was completed. There were no soil or sediment samples exceeding industrial TMCLs for all investigations at SWMU 15. Exceedances for pesticides in soil were excluded because the Army does not clean up applied pesticides. An RFI report will be prepared. After KDHE approval of this RFI report an SOB for no further corrective action planned will be prepared.

CLEANUP/EXIT STRATEGY

The RFI is expected to demonstrate no risk at the site and allow for an NFA determination.

Site ID: SAAP-016
Site Name: Temporary Waste Storage Magazines
Alias: SWMU 16

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: LOW

Contaminants of Concern: Metals, Pesticides, Semi-volatiles (SVOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA	197907	199009
CS	199610	199805
RFI/CMS	200001	201408
LTM	201410	201908

RIP Date: N/A

RC Date: 201408

SITE DESCRIPTION

This site comprises 79 acres in the south central portion of the installation. This area was used as a RCRA Interim Permitted Hazardous Waste Storage area. This area includes the B-Area Storage Buildings B-14, B-16, B-20, B-21 and B-22. Also included are J-125 and Building 181-2 which is located in the central portion of SFAAP. Building 181-2 is an inactive 12 by 15 ft metal structure that was used to store spent degreasing solvents. The building has a concrete floor and is surrounded by an earthen dike. The solvents which were stored in 181-2 were transferred in 1984 to Building J-125, where temporary spill containment was provided. When the upgrading of J-124 was complete, the solvents were then transferred from J-125 to J-124. Over time, 181-2 contained 550 gallons of spent degreasing solvents.

The data from the April 2000 RFI were determined by the regulators to be unreliable (Intertek Testing Services Data). Therefore another RFI was initiated in 2008. Fieldwork was completed. There were no soil or sediment samples exceeding industrial TMCLs for all investigations at SWMU 16. Exceedances for pesticides in the soil were excluded because the Army does not clean up applied pesticides. An RFI report will be prepared. After KDHE approval of this RFI report an SOB for no further corrective action planned will be prepared.

LTM of groundwater is planned due to exceedances of contaminants.

CLEANUP/EXIT STRATEGY

The RFI is expected to demonstrate no risk at the site and allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-017
Site Name: G-Line Area Ditches
Alias: SWMU 17

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: LOW

Contaminants of Concern: Metals, Nitrate/Nitrite

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA	197907	199009
CS	199610	199805
RFI/CMS	200001	201408
DES	201410	201412
IRA	200610	201408
CMI(C)	201501	201508
LTM	201510	202008

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises 284 acres in the south central portion of the installation. This area was used for production of multibase solvent propellant. G-Line operated from 1943-1948, and 1953-1960. It was reported that during the 1940s, the G-line NC wringers overflowed, and NC fines had been observed along drainage ditches from the area leading to Kill Creek. It is likely that G-Line Area ditches received the same types of materials and followed the same historical wastewater treatment practices as the F-Line Area. The G-Line area is situated close to the basin divide between flow westward to Captain Creek and flow eastward to Spoon and Kill Creeks. Consequently, it is possible for contamination to migrate in either direction depending on the location of the source of contamination in the G-Line area. It is possible that small amounts of propellant solids may have settled in these ditches.

As a result of the 1998 EBS SWMU 17 was expanded to include all of G-Line. The ICM for the soil around explosive buildings in G-Line is covered in the AOC 23 Work Plan for SWMU 17. The non-explosive buildings, ditches, and areas away from the explosive buildings are included in the RFI and corrective measures for SWMU 17.

The data from the October 2000 RFI were determined by the regulators to be unreliable (Intertek Testing Services Data). A RFI work plan was prepared in June 2009, which was approved by KDHE. Fieldwork was never started due to insufficient funding.

RFI activities include collecting initial surface soil samples and surface drainage soil samples and selectively analyzing for RCRA metals, manganese, nitrate/nitrite, ammonia, explosives (including NC, NG and NQ), SVOCs, TPH-DRO, TPH-GRO, pesticides and soil pH. Surface soil samples will be collected from all non-explosive buildings biased toward potential release points such as doors and loading platforms. Surface soil samples will be collected every 250 feet along the portions of the wheeling walkways not sampled under the AOC 23 ICM. Samples will also be collected along the tramlines biased toward locations where trams turned or met or where tramlines intersected other lines within SWMU 17. Surface soil samples are proposed at two abandoned monitoring wells (018MW016 and 018MW017) that exhibited elevated nitrate/nitrite levels and a TMCL exceedance for lead at 018MW017 to delineate the sources of these contaminants. Surface soil samples will be collected at the non-PCB oil spill north of Account 5908-1 and at release points discovered during initial sampling. Surface drainage soil samples are proposed to characterize drainage ditches and swales. Samples will be collected at 250-feet increments within the final mixing area, and at 500-feet increments within the finishing area and the north end of the FAD houses area biased towards areas of accumulation or where visual evidence of contamination exists. Ten percent of the samples collected from drainage ditches extending away from accounts where pesticide drill holes are present will be analyzed for pesticides. Surface water/sediment sample pairs will be collected within and downstream of SWMU 17. Groundwater samples from the existing monitoring wells will be collected. Groundwater grab samples will be collected using DPT at the two abandoned monitoring wells in SWMU 17.

Vertical delineation of contamination discovered during initial sampling will performed using DPT. The exact number and locations

of subsurface soil samples that will be collected will be determined based upon the analytical results for initial surface soil sampling activities. New bedrock monitoring wells will be installed and groundwater samples taken.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

The ICM (pre-AOC 23) involves collecting soil samples and sending to an off-site laboratory for analysis to horizontally delineate surface area of soil contamination around MEC foundations. One fixed-base laboratory sample will be collected every 30 linear feet. Additional samples are required for foundations that are not in exactly 30 linear feet increments. An estimated failure rate of 15 percent of these samples having contaminants above TMCLs requiring excavation then requires step out samples to horizontally delineate the surface soil contamination. Three surface samples bound each exceedance horizontally (the foundation bounds the fourth side). An estimated failure rate of five percent of the step out samples having contaminants above TMCLs requiring excavation then requires additional step out samples to horizontally delineate the surface soil contamination. Grids with TMCL exceedances will be excavated. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation.

LTM is planned and involves sampling six wells twice a year for five years. Contaminants to analyze for in the groundwater samples are RCRA metals, VOCs, and SVOCs.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-018
Site Name: Old/New Sanitary Landfill
Alias: SWMU 18

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: LOW

Contaminants of Concern: Dioxins/Dibenzofurans, Metals, Nitrate/Nitrite, Semi-volatiles (SVOC)

Media of Concern: Groundwater, Sediment, Soil

Phases	Start	End
RFA	197907	199009
CS	199408	199805
RFI/CMS	199810	200609
DES	201407	201408
IRA	200010	200210
CMI(C)	201410	201608
LTM	201610	204608

RIP Date: N/A

RC Date: 201608

SITE DESCRIPTION

This site comprises 50 acres in the west central portion of the installation. This area was used for disposal of solid waste. The landfills employed a trench-type operation. Several types of landfills are included in the landfill area: the sanitary landfill (31 acres); the asbestos landfill (one acre) and the ash landfill (19 acres, SAAP-019). This landfill area began operation in 1943. Prior to the designation of the New Sanitary Landfill in 1967, refuse of all types was buried at a site just south of the new landfill. No records from the Old Landfill were available. SFAAP no longer uses the New Sanitary Landfill; currently, waste is disposed off-site. Although there was no hazardous waste placed in either landfill, there is one area reported to have received containers of a lead compound east of the landfill, and two areas with known asbestos waste near the Sanitary Landfill.

The RFI report states that the primary concerns at SFAAP-018 and 019 are the constituents detected in groundwater (sulfide; cis-1,3-dichloropropene and ammonia nitrogen), and dioxins/furans in the shallow soil. Institutional controls have been implemented (fencing) to control site access. An ICM for eroded areas was completed in September 2003. Shallow groundwater flowing through a sand lens within the site complicates the final corrective measures.

A May 2006 RFI delineated the exact boundaries of the disposal cells, and also a hydrogeological investigation was conducted. A large trackhoe was used to delineate the boundaries of SWMUs 18, 19, and 49. No waste was found in SWMU 49. Delineated areas of SWMUs 18 and 19 were surveyed and show that SWMU 18 is 19.8 acres, and SWMU 19 is 1.2 acres for a total of 21 acres. The SWMU 18 landfill was no longer used after June 1988. The new part of the SWMU 18 landfill was properly closed. Per a KDHE letter dated Nov. 22, 2000 they state that the old area of the SWMU 18 landfill has insufficient cover and therefore was not properly closed. Therefore a typical landfill cap has to be installed over the SWMU 18 landfill. There currently is no groundwater monitoring. Monitoring and maintenance of the landfill cover is ongoing.

Corrective measures activities will include construction of a 31 acre landfill cap. An 8,050 linear feet french drain will be constructed upgradient (east) of the landfill to reduce groundwater flow through the site.

LTM of groundwater is planned and involves sampling eight wells twice a year for five years, and then once a year for 25 years. Contaminants to analyze for in the groundwater samples are metals, VOCs, SVOCs, and dioxins. LTM of the landfill cap and french drain will be required.

Abandonment (closure) of all groundwater monitoring wells is planned under this site and includes abandonment of 629 linear feet of four inch wells and 8,532 linear feet of two inch wells.

CLEANUP/EXIT STRATEGY

Site ID: SAAP-018
Site Name: Old/New Sanitary Landfill
Alias: SWMU 18

[redacted]

Closure requirements are expected to include installation and maintenance of an engineered cap, with inspections and cap maintenance as part of the LTM.

Site ID: SAAP-019
Site Name: Ash Landfills
Alias: SWMU 19

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: LOW

Contaminants of Concern: Dioxins/Dibenzofurans, Metals

Media of Concern: Soil

Phases	Start	End
RFA	197907	199009
CS	199408	199605
RFI/CMS	199606	201508
IRA	200610	201508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises two areas, 19 acres in the west central portion of the installation and one acre in the central portion of the installation. This area was used as for disposal of fly ash and coal fines. There are two, unlined ash landfills. SAAP-019 West is located north of SAAP-018 and will be addressed under SAAP-018. SAAP-019 East is located southeast of Power House No. 1. It has been reported that SAAP-019 West was used prior to 1966. The ash landfills contain unknown quantities of fly ash from the ash-sluice system and coal fines from the coal pile. Fly ash sometimes contains heavy metals.

A May 2006 RFI delineated the exact boundaries of the disposal cells. A large trackhoe was used to delineate the boundaries of SWMU 19 West, which was surveyed and is 1.2 acres. This landfill is closed. Currently, there is no groundwater monitoring. Monitoring and maintenance of the landfill cover is ongoing.

In the area southeast of Power House No. 1 the buried coal fines will be excavated and disposed of off-site. It is anticipated that the contaminated soil will not require stabilization because it already is below TCLP for landfilling at a Subtitle D Landfill.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil/sludge is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is not anticipated at this site.

Site ID: SAAP-020
Site Name: Ash Lagoons
Alias: SWMU 20

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: HIGH

Contaminants of Concern: Metals, Nitrate/Nitrite

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA	197907	199009
CS	199509	199805
RFI/CMS	199604	201408
IRA	200507	201408

RIP Date: N/A

RC Date: 201408

SITE DESCRIPTION

This site comprises 15 acres in the north central portion of the installation. This area was used for settling out fly ash from Power House No. 1 via an ash-sluice system. There are four Ash Lagoons, all are 15 feet deep. Lagoon 165-1 was 103,600 square feet, Lagoon 165-2 was 118,900 square feet, Lagoon 165-3 was 95,000 square feet, Lagoon 165-4 was 10,000 square feet. These lagoons began operation in 1979 to collect fly ash and bottom ash from the coal fired boilers in Power House No. 1 via an ash-sluice system. The ash wastes (which may contain heavy metals) were allowed to settle out in the lagoons and the slightly alkaline wastewater was filtered and recycled back to the boiler house. Lagoons 165-1, 165-2, and 165-3 were periodically dredged and the sludge was landfilled in the Ash Landfill (SWMU 19).

The data from the May 2000 RFI were determined by the regulators to be unreliable (Intertek Testing Services Data). The 2005 RFI found no ash sludge in Lagoons 165-2, 165-3, or 165-4. Ash sludge was found to be an average of 12.5 feet deep in lagoon 165-1. Therefore, the excavation total was estimated to be 55,500 cubic yards.

A wastewater lagoon closure & verification sampling work plan was approved by KDHE in April 2008. The lagoons berms were breached for passive dewatering of the ash sludge. Once the sludge dried out enough for landfill acceptance the sludge was loaded for transportation and offsite disposal at a Subtitle D Landfill. A total of 121,619 tons of sludge from SWMU 20 was excavated and disposed of. Post excavation confirmation samples are below residential risk levels. The area was graded to drain and revegetated. A wastewater lagoon closure completion report will be prepared. After KDHE approval of this report an SOB for no further corrective action planned will be prepared.

CLEANUP/EXIT STRATEGY

Remediation at this site is complete. A corrective measures completion report will be prepared and should allow for an NFA determination.

Site ID: SAAP-021
Site Name: Contaminated Materials Burn Ground
Alias: SWMU 21

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: HIGH

Contaminants of Concern: Dioxins/Dibenzofurans, Explosives, Metals, Nitrate/Nitrite, Petroleum, Oil and Lubricants (POL), Polychlorinated Biphenyls (PCB), Polycyclic Aromatic Hydrocarbons (PAH), Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Building Decontamination, Sediment, Soil

Phases	Start	End
RFA	197907	199009
CS	199408	199805
RFI/CMS	199601	200411
DES	200505	200601
CMI(C)	200505	201408
LTM	201410	201908

RIP Date: N/A

RC Date: 201408

SITE DESCRIPTION

This site comprises 10 acres in the west central portion of the installation. This area was used for open burning combustible material contaminated with explosive residues, and flashing non-combustible material contaminated with explosive residues. Used oil was also open burned in this area. The site was built in 1942. Prior to 1970, burning of contaminated materials occurred in two open trenches; however, in about 1970, the two trenches were filled and two unlined 30 feet by 300 feet pads were installed where the trenches were located. The pads were separated by an earthen berm. Contaminated material accumulated at the site until the pad was full, which generally took one to two months. Burning was initiated using diesel fuel, waste oils, and scrap wood (including telephone poles). SFAAP randomly sampled the remaining residue for TCLP metals (leachable), and upon negative results disposed the ash in the sanitary landfill (SWMU 18). After one pad was burned, the other pad began receiving materials for the next burn. During a site visit in 1990, burn areas were observed away from the main burn pads.

Also located on the site was an open top tank, eight feet in diameter, which was used to burn waste solvent and used oil. Adjacent to the tank was an elevated platform which appeared to have been used as an unloading dock for containers of liquids to be emptied into the tank. At the time of a 2001 site visit, the tank contained water. Groundwater and surface water runoff from the burn area flows northwest to Captain Creek or the adjacent oxbow.

The May 1997 and April 2002 RFI results indicated the presence of dioxins, metals, solvents, and petroleum hydrocarbons in soil. Petroleum hydrocarbons and VOCs were detected in groundwater and surface water. Additional delineation sampling was completed in spring 2003. Due to the detected ongoing release of POLs from POL-contaminated soil to Captain Creek an ex situ bioremediation pilot test for TPH, VOC and PAHs in the soil was conducted 2004. Approximately 5,000 cy of POL-contaminated soil was excavated and bioremediated in 2004 (from Area D).

A CMS was completed in November 2004.

Corrective measures were implemented in November 2007. A total of 66,381 tons of contaminated soil was excavated and disposed of. It was also necessary to pump and haul to the local publicly-owned treatment works (POTW) 320,000 gallons of groundwater from the deep excavation in Areas D, E, and F in order to complete the deep soil excavations. A corrective measures completion report was submitted to KDHE and is awaiting approval.

A CMS for groundwater at SWMU 21 was prepared and approved by KDHE. Three new groundwater monitoring wells were installed. Monitoring of contaminated groundwater will continue.

Site ID: SAAP-021
Site Name: Contaminated Materials Burn Ground
Alias: SWMU 21

CLEANUP/EXIT STRATEGY

Remediation at this site is complete. A corrective measures completion report will be prepared and allow for an NFA determination. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-022
Site Name: Old Explosive Waste Burning Ground
Alias: SWMU 22

STATUS

Parcel: NONE

Regulatory Driver: RCRA
RRSE: HIGH

Contaminants of Concern: Explosives, Metals

Media of Concern: Sediment, Soil

Phases	Start	End
RFA	197907	199009
CS	199403	199805
RFI/CMS	199601	199910
DES	200110	200404
IRA	200807	201508
CMI(C)	200206	201508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises 30 acres in the west central portion of the installation. This area was used to open burn waste explosives on designated pads. The waste explosive included NG slums (i.e., NG mixed with sawdust for stabilization) and various propellant formulations from the production area sumps, filters, settling ponds, and drains. The site was in operation from 1943 to 1980. SAAP-022 includes seven acres containing five burning pads, and a NG slums burning area. During a groundwater contamination survey in 1987, it was reported that the site was a grass covered field showing no signs of vegetative stress.

The March 1997 RFI detected lead and NG in surface soil above action levels.

A CMS was completed in February 1999.

Corrective measures were implemented in 2004-2005. A total of 46,997 tons of contaminated soil was excavated and disposed of . All remaining soil in SAAP-022 was below unrestricted levels as reported in the corrective measures completion report by Shaw Environmental in January 2006. One round of groundwater sampling was conducted. No contaminants above action levels were detected in the groundwater, therefore LTM is not planned.

A request for NFA was written by the Army and sent to KDHE in March 2008. In a letter dated April 20, 2009 KDHE denied the NFA request based on data gaps KDHE found in the corrective measures completion report for SWMU 22. Additional investigation and cleanup is required to fill these data gaps. There is no funding under the RFI/CMS phase schedule because the characterization sampling will be done during the ICM. The areas requiring sampling are very well defined because of the characterization sampling during the CMI, and therefore an additional RFI is not necessary.

Soil samples will be collected and sent to an off-site laboratory for analysis to horizontally delineate surface area of soil contamination. An estimated failure rate of 15 percent of these samples having contaminants above TMCLs requiring excavation then requires step out samples to horizontally delineate the surface soil contamination. Three surface samples bound each exceedance horizontally (the contaminated area in on the fourth side). An estimated failure rate of five percent of the step out samples having contaminants above TMCLs requiring excavation then requires additional step out samples to horizontally delineate the surface soil contamination. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation.

There will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

Site ID: SAAP-022
Site Name: Old Explosive Waste Burning Ground
Alias: SWMU 22

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is not anticipated at this site.

Site ID: SAAP-024
Site Name: Nitroglycerine and Paste Mix Areas
Alias: SWMU 24

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: HIGH

Contaminants of Concern: Metals, Nitrate/Nitrite, Volatiles (VOC)

Media of Concern: Groundwater, Sediment, Soil, Surface Water

Phases	Start	End
RFA	197907	199009
CS	199408	199805
RFI/CMS	199806	201408
DES	201410	201412
IRA	200610	201408
CMI(C)	201501	201508
LTM	201510	202508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises 149 acres in the central portion of the installation. This area was used as an area to produce NG, mix pastes for double-base solventless propellant and multi-base solvent propellant. The NG area includes four NG Nitrator, Neutralization and Storehouse complexes with sumps, and drainage ditches that extend from the production buildings to Pyotts Pond (SAAP-012). The F-Line and N-Line Paste Mix Area is located northeast of the NG Area and produced double-base solventless propellant paste for the 2.75 rocket grains. The G-Line Paste Mix area is located southwest of the NG Area and produced multi-base solvent propellant paste for cannon propellant grains. As a result of the 1998 EBS the boundary of this site was expanded from just the NG Production Area to include the F-Line, G-Line and N-Line Paste Mix Areas.

During the March 1998 RFI the downgradient ditch areas of SAAP-024 were investigated. The RFI was deemed incomplete by USEPA and KDHE. Sampling was not conducted in NG Nitrator areas due to the potential explosive hazards associated with NG in soils at concentrations that may exceed 10 percent. The data from the initial RFI identified eighteen metals, nitrates, sulfates, PAHs, SVOCs and NC above background concentrations at SWMU 24. Metals, PAHs and SVOCs were detected in all media (surface water, groundwater, sediment and surface soil), nitrates and sulfate were detected in surface water and groundwater, and NC was detected in surface soil and sediment.

Due to the potential presence of reactive levels of NG in the NG Production area of SWMU 24, an explosive safety assessment was conducted in 2004 to determine if there was an explosive hazard requiring an explosive safety submission before RFI or CMI work could be performed. A remotely operated Geoprobe® was used to take soil borings from zero to four feet in all of the NG Sumps, the ditches downgradient of the sumps, and two recorded spill areas. The highest concentration detected was 485 milligrams (mg)/kilogram (kg), which is well below the explosive level (less than 10 percent). Therefore remote investigation and cleanup is not required, i.e. the standard investigation and cleanup methods are safe from explosive hazards.

An RFI work plan was prepared in December 2008, which was approved by KDHE. The fieldwork was started, but was stopped due to insufficient funds.

ICM for contaminated soil underneath explosive foundations and sewers is covered in the AOCs 23/24 ICM for SAAP-024. The workplan for AOCs 23/24 ICM at the F-Line Paste Mix Area in SAAP-024 was prepared in March 2011, and is awaiting approval by KDHE.

The ICM (pre-AOC 23) involves collecting soil samples and sending to an offsite laboratory for analysis to horizontally delineate surface area of soil contamination around MEC foundations. One fixed-base laboratory sample will be collected every 30 linear around each MEC foundation. Additional samples are required for foundations that are not in exactly 30 linear feet increments. An

estimated failure rate of 15 percent of these samples having contaminants above TMCLs requiring excavation then requires step out samples to horizontally delineate the surface soil contamination. Three surface samples bound each exceedance horizontally (the foundation bounds the fourth side). An estimated failure rate of five percent of the step out samples having contaminants above TMCLs requiring excavation then requires additional step out samples to horizontally delineate the surface soil contamination. Grids with TMCL exceedances will be excavated. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation.

Post excavation confirmation samples (one per 900 square feet) will be collected after the soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

LTM is planned and involves sampling ten wells twice a year for five years. Contaminants to analyze for in the groundwater samples are RCRA metals, explosives, and SVOCs.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-025
Site Name: Nitrocellulose Area Ditches
Alias: SWMU 25

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: HIGH

Contaminants of Concern: Explosives, Metals

Media of Concern: Groundwater, Sediment, Soil

Phases	Start	End
RFA	197907	199009
CS	199610	199805
RFI/CMS	200001	200509
DES	201407	201408
CMI(C)	201410	201508
LTM	201510	202008

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises 244 acres in the north central portion of the installation. This area was used to convey acidic wastewater and other wastewater from the NC Production Area (SAAP-116) to Pond A (SAAP-004). SAAP-025 consists of 41,000 linear feet of ditch leading from the edge of the NC Production Area to Pond A. NC production involved the use of significant amounts NC fibers, acids and wash/rinse water. There were two types of wastewater: acid wastewater was direct discharged through baffled settling tanks; NC wastewater resulted from boiling, screening and blending, after which the water passed through a NC fines settling pit. Wastewaters were reported as milky in color, containing suspended NC fibers. All wastewater was conveyed via an underground sewer system that discharged to an open drainage ditch leading to Pond A for sedimentation of solids and equalization of wastewater. NC production ceased in 1971. NC has little vertical migration potential, but may exist in sediment layers below the surface. NC has no toxic properties but a TMCL of 1,000 mg/kg was established by the regulators for the site (approximately one percent of the explosive concentration).

The data from the November 2000 RFI were determined by the regulators to be unreliable (Intertek Testing Services Data).

The June 2006 RFI baseline screening risk assessment determined that metals pose an unacceptable risk to human health. Therefore a cleanup is required.

Previous studies indicate that 2,500 linear feet of ditches will require excavation. It is anticipated that the contaminated sediment will not require stabilization because it already is below TCLP for disposal at a Subtitle D landfill.

LTM is planned and involves sampling four wells twice a year for five years. Contaminants to analyze for in the groundwater samples are RCRA metals, and manganese.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-026
Site Name: Single Base Propellant Area Sumps
Alias: SWMU 26

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: MEDIUM

Contaminants of Concern: Explosives, Metals, Pesticides, Polychlorinated Biphenyls (PCB), Polycyclic Aromatic Hydrocarbons (PAH)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA	197907	199009
CS	199610	199808
RFI/CMS	200001	201408
DES	201410	201412
IRA	200705	201408
CMI(C)	201501	201508
LTM	201510	202008

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises 501 acres in the north central portion of the installation. This area was used to produce single-, double-, and triple-base solvent propellant grains. Site SAAP-026 is SWMU 26, which consists of three single base propellant lines (B-Line, C-Line, and D-Line). The base explosive, NC, in single base propellant was mixed with dinitrotoluene (DNT), stabilizers, and burn modifiers using an ether-alcohol mix as the mixing solvent. The propellant paste was extruded by presses and then the grains were cut to length. The propellant grain manufacturing process was completed in the Finishing Area located within SWMU 26 to the west of the mixing lines. SWMU 26 also includes a multi-base propellant line (E-Line) where double base (NC and NG), and triple base (NC, NG, NQ) propellants were produced. The mixing solvent for multi-base propellant was an acetone-alcohol mix. The finishing area for E-Line is not included in SWMU 26, but was instead made a separate site, AOC 11, which is SAAP-111. Production was documented during the period of 1943-1948 for B-Line and C-Line. Production was documented during the periods of 1943-1948 and 1951-1960 for D-Line and E-Line.

As a result of the 1998 EBS the boundary of this site was expanded from just the Single Base Solvent Propellant Finishing Area to include the B-, C-, D-, and E-Line paste mix and grain production areas.

A hazardous waste study of SWMU 26 was completed in 1985. An RI report was completed in September 1989. An RFI was completed in May 2001. An RRSE of the paste mixing, pressing and cutting area of B-Line, C-Line, D-Line, and E-Line was completed in 2003. The results from these reports indicate that SAAP-026 contains contaminants above risk levels, and includes ammonia, arsenic, chromium, 2,4-DNT, lead and mercury.

The data from the May 2001 RFI were determined by the regulators to be unreliable (Intertek Testing Services Data). Therefore another RFI was prepared in 2009, which was approved by KDHE. The fieldwork was started, but was stopped due to insufficient funds.

ICM for contaminated soil underneath explosive foundations and sewers is covered in the AOCs 23/24 ICM for SAAP-026. The ICM work plan was prepared in September 2009, and was approved by KDHE. Field work was started, but was stopped due to insufficient funds.

To finish the AOCs 23/24 ICM for SAAP-026, the data from Tetra Tech's rind soil sampling under the AOC 23 ICM work plan will be used to determine the number of exceedances of industrial TMCLs. Grids with TMCL exceedances will be excavated. An estimated failure rate of 25 percent of the post excavation confirmation samples of the excavation grids will require re-remediation.

Post excavation confirmation samples (one per 900 square feet) will be collected after the soil is excavated and stockpiled. The

contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed the area where the stockpiles were will be sampled one per ~285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

To finish the RFI, vertical delineation of contamination discovered during initial sampling will performed using DPT. The exact number and locations of subsurface soil samples that will be collected will be determined based upon the analytical results for initial surface soil sampling activities. Groundwater monitoring wells will be installed and five groundwater samples taken.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

LTM is planned and involves sampling nine wells twice a year for five years. Contaminants to analyze for in the groundwater samples are RCRA metals, manganese, VOCs, SVOCs, nitrate, and explosives.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-027
Site Name: NQ Area SAC & LWTP Evap. Lagoons
Alias: SWMU 27

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA

RRSE: LOW

Contaminants of Concern: Explosives, Metals, Nitrate/Nitrite, Semi-volatiles (SVOC)

Media of Concern: Groundwater, Sediment, Soil

Phases	Start	End
RFA	197907	199009
CS	199408	199705
RFI/CMS	199510	199909
IRA	199901	199905
LTM	199910	204408

RIP Date: N/A

RC Date: 199909

SITE DESCRIPTION

This site comprises 10 acres in the northwest portion of the installation. This area was used for evaporative lagoons to hold wastewater from the NQ Production Area. The sulfuric acid concentrator (SAC) LWTP went into operation in 1984. It consisted of a 45,000 gal tank for distillate and a 17,000 gal tank for other corrosives. It received corrosive distillate from the SAC and some corrosive wastewater from the NQ production processes. Lime neutralizers were added to the acidic wastewater, which then flowed into the two evaporative lagoons located south of the LWTP. The wastewater transfer line from the LWTP to the evaporative lagoons had documented releases. The lagoons were constructed in 1984. In 1987 the lining of the lagoons appeared damaged. Observations of higher soil moisture and occasional small amounts of water at the base of the berm on the west side of the southern lagoon indicated releases were occurring. The lining was replaced. It was reported that when the liner was replaced in one of the lagoons the breaks in the old liner indicated that releases to the underlying soil did occur.

The May 1999 RFI indicated that the wastewater and sludge in the evaporative lagoons was causing groundwater contamination with NQ, GN, nitrates and sulfates.

In a letter dated March 11, 1996, KDHE approved a schedule of work for remediation of the lagoon sludge and dismantlement of the lagoons. This action partially fulfilled KDHE requirements for lagoon closure. This ICM work was completed in August 1999. LTM of contaminated groundwater will continue.

In 2004 the underground LWTP transfer line from the SAC to the evaporative lagoons was removed, and confirmation soil samples were collected.

LTM is planned and involves sampling nine wells twice a year for 10 years. Contaminants to analyze for in the groundwater samples are RCRA metals, NG, NQ, nitrates, and sulfates.

CLEANUP/EXIT STRATEGY

LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-030
Site Name: Pesticide Handling Area
Alias: SWMU 30

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: LOW

Contaminants of Concern: Dioxins/Dibenzofurans, Metals, Pesticides, Petroleum, Oil and Lubricants (POL)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA	197907	199009
CS	199610	199805
RFI/CMS	200001	201408
DES	201410	201412
IRA	200905	200908
CMI(C)	201501	201508
LTM	201510	202008

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises 20 acres in the north central portion of the installation. This area was used for storing and mixing herbicides and pesticides. The pesticide storage and mixing building was constructed in 1943. A new building was erected a short distance from the old structure that it replaced. The old facility and its surrounding area were reportedly cleaned of pesticide residues. The new facility met US Army Environmental Hygiene Agency's (USAEHA's) criteria for design of a pest control shop, pesticide storage and mixing facility. It was in operation from 1984 to 2001. The facility contains four sumps, one in each room: the pesticide storage room, the herbicide storage room, the inside mixing room and the outside mixing area. All liquid within the sumps was recycled into formulations, and there is no discharge from the sumps. No spills or releases have been recorded for this site.

During a preliminary review site visit to the Pesticide Handling Area in 1990, an aqua-blue stain was evident at the outside sump and outside the pesticide building. It was identified as a dibromide solution which is sprayed as an indicator dye in areas where herbicides/pesticides were used. Any contamination is assumed to have resulted from operations at the former Pesticide Mixing Shop and not the new Pesticide Mixing Shop. It was also noted that stressed vegetation was observed leading from the shop and following a newly constructed road; however, SFAAP personnel indicated an underground steam line in the area may have impacted the vegetation.

The data from the May 2001 RFI were determined by the regulators to be unreliable (Intertek Testing Services Data). Therefore another RFI was prepared in October 2008, which was approved by KDHE. The fieldwork was completed. There were five soil samples at five sample locations with industrial TMCL exceedances. An RFI report will be prepared.

ICMs were conducted in 2009 to clear an area of pesticide contaminated soil found during the RFI so that a leaking underground water line could be repaired. A total of 40 tons of contaminated soil as non-hazardous waste was excavated and disposed of.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

LTM is planned and involves sampling five wells twice a year for five years. The contaminant to analyze for in the groundwater samples is dieldrin.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for

an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-031
Site Name: Contaminated Waste Processor
Alias: SWMU 31

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: MEDIUM

Contaminants of Concern: Dioxins/Dibenzofurans, Explosives, Metals, Nitrate/Nitrite

Media of Concern: Groundwater, Sediment, Soil

Phases	Start	End
RFA	197907	199009
CS	199408	199805
RFI/CMS	200001	201408
DES	201410	201412
IRA	200610	201408
CMI(C)	201501	201508
LTM	201510	202008

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises seven acres in the west central portion of the installation. This area was used to decontaminate material containing explosive residues. The Contaminated Waste Processor (CWP) operated between 1982 and 1996. The CWP is an incinerator measuring 14.5 feet by 25 feet. The CWP was designed to incinerate materials contaminated or suspected of being contaminated with explosives, and to decontaminate (flash) explosive-contaminated metal prior to salvage. Because the CWP could only handle materials with residual amounts of explosives, the waste materials to be incinerated were checked to insure they did not contain pockets of explosives. Lab analysis was conducted after the burn to verify the ash debris could be disposed in the onsite landfill. If the ash debris exceeded any TCLPs it was disposed off-site as hazardous waste.

The April 1999 RFI results indicated the presence of phthalates in the soil samples. No contamination was found in the groundwater.

KDHE and USEPA identified several significant data gaps in the 1999 RFI that had to be addressed. Because of insufficient data, KDHE and USEPA requested that the Army conduct a more extensive investigation to fully characterize the extent of contamination by selectively sampling for RCRA metals, manganese, explosives (including NC, NG, NQ, and GN), SVOCs TPH-DRO, PCBs, and dioxins, in soil, surface water, sediment, and groundwater.

An RFI work plan was prepared in March 2009, and was approved by KDHE. Fieldwork was completed. An RFI report will be prepared.

ICM for contaminated soil underneath explosive foundations is covered in the AOCs 23/24 ICM for SWMU 31.

The ICM (pre-AOC 23) involves collecting soil samples and sending to an offsite laboratory for analysis to horizontally delineate surface area of soil contamination around MEC foundations. One fixed-base laboratory sample will be collected every 30 linear around each MEC foundation. Additional samples are required for foundations that are not in exactly 30 linear feet increments. An estimated failure rate of 15 percent of these samples having contaminants above TMCLs requiring excavation then requires step out samples to horizontally delineate the surface soil contamination. Three surface samples bound each exceedance horizontally (the foundation bounds the fourth side). An estimated failure rate of five percent of the step out samples having contaminants above TMCLs requiring excavation then requires additional step out samples to horizontally delineate the surface soil contamination. Grids with TMCL exceedances will be excavated. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure

rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil/sediment is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

Additional corrective measures will be excavation of the contaminated sludge in the CWP evaporative lagoon. Prior studies indicate that contaminants of potential concern will be immobile in the surface soils to a depth of 6-inches in the berm sidewalls and bottom of the lagoon. The lagoon is located adjacent to the CWP, and measures approximately 250 feet (north/south) by 160 (east/west). The berm heights were measured at 10 feet deep. Water levels in the lagoon fluctuate seasonally, but the depth of the water to the surface of the sludge was approximately eight feet. The lagoon will be closed in accordance with KDHE Nonhazardous Industrial Wastewater Lagoon Closure requirements.

LTM is planned and involves sampling three wells twice a year for five years. The contaminant to analyze for in the groundwater samples is nitrate.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-032
Site Name: Lead Decon. and Recovery Unit
Alias: SWMU 32

STATUS

Parcel: NONE

Regulatory Driver: RCRA
RRSE: HIGH

Contaminants of Concern: Explosives, Metals, Pesticides, Polychlorinated Biphenyls (PCB)

Media of Concern: Sediment, Soil

Phases	Start	End
RFA	197907	199009
CS	199408	199805
RFI/CMS	199601	201408
IRA	200109	200310

RIP Date: N/A

RC Date: 201408

SITE DESCRIPTION

This site comprises one acre in the west central portion of the installation. This area was used to explosively decontaminate lead, and melt the lead to form ingots for recycling. The site borders the Captain Creek flood plain. Surface drainage is toward a southwest drainage ditch which subsequently drains west near the Old Explosive Waste Burning Ground (SWMU 22) to Captain Creek. Some runoff also eventually drains into an oxbow near Captain Creek. The site formerly contained a small building and melting rack within a paved area. The Recovery Unit was in operation from 1943 to 1970. Contaminated lead recovered from routine maintenance activities in the acid, NG, and propellant manufacturing buildings was placed on a rack and suspended over a tank. An overhead heater melted the lead, which then dropped into the tank. The lead was drained into molds and made available for salvage/recycling. Lead solids had been observed scattered throughout the site. Lead was the primary constituent of concern at this site. It is somewhat soluble under acidic conditions.

An RI report was completed September 1989. An RFI was completed in March 1997. A CMS was completed in February 1999. The results from these reports indicated Lead in the soil above action levels. A leaking underground storage tank (UST) was removed from this site under the UST program.

The ICM was implemented in 2002, and 803 cubic yards of lead contaminated soil was excavated, treated and disposed offsite. In addition to the ICM a leaking UST soil removal has been completed and the site was clean closed. The groundwater at this site was sampled under SAAP-022. No contaminants were detected above action levels in the groundwater. Therefore NFA was planned for this site.

A request for NFA was written by the Army and sent to KDHE in March 2007. In a letter dated April 16, 2009 KDHE denied the NFA request based on data gaps KDHE found in the ICM completion report for SWMU 32.

The data gaps were addressed by the following actions: A staging pile permit was obtained under EPA's RCRA permit for SFAAP, and was built in 2009 in the area of all of SWMU 32 and some of SWMU 22. The staging piles were used for contaminated soil excavated at SWMU 21 because SWMU 21 is in a flood plain. After completing the cleanup of SWMU 21, closure of the staging piles was performed by removing the liners and scraping the soil under the liners, followed by gridded sampling. The July 2010 Staging Piles Closure Report's sample results show that all of the area of SWMU 32 is below TMCLs; however, the report was not approved by USEPA. After USEPA approves this report a site closeout document will be prepared.

CLEANUP/EXIT STRATEGY

Remediation at this site is complete. A corrective measures completion report will be prepared and should allow for an NFA determination.

Site ID: SAAP-033
Site Name: Paste Area Half Tanks & Ditches
Alias: SWMU 33

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: HIGH

Contaminants of Concern: Explosives, Metals, Semi-volatiles (SVOC)

Media of Concern: Groundwater, Sediment, Soil

Phases	Start	End
RFA	197907	199009
CS	199610	199805
RFI/CMS	199810	200309
IRA	200010	200309
LTM	200310	201708

RIP Date: N/A

RC Date: 200309

SITE DESCRIPTION

This site comprises one acre in the central portion of the installation. This area was used to settle out propellant solids from the wastewater discharged from the F-Line and N-Line paste mix area. The half tanks in this area received wastewater from wash down of propellant processing equipment and buildings in the paste mix area. They were used from 1965 to 1971. The half tanks discharged into two unlined settling ponds, then to Pyotts Pond. There were two steel half tanks located upgradient from each of the settling ponds and are designated half tank 33/34 and 33/35. The 33/34 tank was located southeast of the paste mix area between the Five Corners Settling Ponds and the Paste Sumps, and the 33/35 tank was located northwest of the paste mix area near the F-Line Paste Mix Settling Ponds. Reportedly, overflowing of the metal flumes and half tanks occurred. There was no secondary containment around the half tanks.

The April 2002 RFI results indicated the presence of lead, NG, NC, and SVOCs in the soil.

ICM occurred in 2002 and consisted of removal and decontamination of the half tanks, removal of 60 cy of impacted soils from around the half tanks and 700 cubic yards of contaminated soil from drainage ditches extending from the half tanks to their stream discharge point. Confirmation samples were collected to verify that remaining soils met KDHE residential requirements. The ditches extending from the half tanks upgradient to the source area will be remediated as part of the SWMU 24 cleanup.

Groundwater monitoring at SWMU 33 detected metals, SVOCs, and sulfate above industrial risk levels. Therefore LTM will continue to be conducted at SWMU 33.

LTM is planned and involves sampling five wells twice a year for four years. Contaminants to analyze for in the groundwater samples are metals, SVOCs, explosives, nitrate, ammonia, and sulfate.

CLEANUP/EXIT STRATEGY

LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-034
Site Name: Five Corners Settling Ponds
Alias: SWMU 34

STATUS

Parcel: NONE

Regulatory Driver: RCRA
RRSE: HIGH

Contaminants of Concern: Explosives, Metals, Semi-volatiles (SVOC)

Media of Concern: Groundwater, Sediment, Soil

Phases	Start	End
RFA	197909	199009
CS	199610	199805
RFI/CMS	199810	201408
IRA	200010	201408
LTM	201410	201908

RIP Date: N/A

RC Date: 201408

SITE DESCRIPTION

This site comprises one acre in the central portion of the installation. This area was used to settle out propellant solids from the wastewater discharged from the F-Line and N-Line Paste Mix Area. There were two earthen, unlined ponds (5A, 5B), each 40 ft in diameter. The ponds were used periodically from 1953 to 1971. There were no secondary containment berms surrounding these ponds. The Settling Ponds received paste mix wastewater resulting from the wash down of equipment and buildings and from sprinkler trips.

The April 2002 RFI results indicated the presence of lead, NG, NC, and SVOCs in soil.

ICM occurred in 2002 and consisted of removal of 900 cy of contaminated soil. Post excavation confirmation sampling found no contaminants above unrestricted levels.

Groundwater monitoring at SWMU 34 detected metals, SVOCs, and sulfate above industrial risk levels. Therefore groundwater monitoring will continue to be conducted at SWMU 34.

A request for NFA was written by the Army and sent to KDHE in December 2007. In a letter dated March 23, 2009 KDHE denied the NFA request based on data gaps KDHE found in the ICM completion report for SWMU 34. Additional investigation and cleanup is required to fill these data gaps. There is no funding under the RFI/CMS phase schedule because the characterization sampling will be done during the ICM. The areas requiring sampling are very well defined because of the characterization sampling during the previoius ICM, and therefore an additional RFI is not necessary.

Soil samples will be collected and sent to an off-site laboratory for analysis to horizontally delineate surface area of soil contamination. An estimated failure rate of 15 percent of these samples having contaminants above TMCLs requiring excavation then requires step out samples to horizontally delineate the surface soil contamination. Three surface samples bound each exceedance horizontally (the contaminated area in on the fourth side). An estimated failure rate of five percent of the step out samples having contaminants above TMCLs requiring excavation then requires additional step out samples to horizontally delineate the surface soil contamination. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation.

There will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

LTM is planned and involves sampling three wells twice a year for four years. Contaminants to analyze for in the groundwater samples are metals, SVOCs, VOCs, explosives, nitrate, ammonia, and sulfate.

Site ID: SAAP-034
Site Name: Five Corners Settling Ponds
Alias: SWMU 34

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-035
Site Name: Nitroglycerine Area Settling Ponds
Alias: SWMU 35

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA

RRSE: MEDIUM

Contaminants of Concern: Explosives, Metals, Semi-volatiles (SVOC)

Media of Concern: Groundwater, Sediment, Soil

Phases	Start	End
RFA	197909	199009
CS	199610	199805
RFI/CMS	199810	200309
IRA	200010	200309
LTM	200310	201708

RIP Date: N/A

RC Date: 200309

SITE DESCRIPTION

This site comprises one acre in the central portion of the installation. This area was used to settle out propellant solids from the wastewater discharged from the F-Line and N-Line paste mix area. The NG Production Area did not discharge to these settling ponds. There were two earthen, unlined ponds (6A, 6B), each 40 feet in diameter. The ponds were used periodically from 1953 to 1971. There were no secondary containment berms surrounding these ponds. The Settling Ponds received paste mix wastewater resulting from the wash down of equipment and buildings and from sprinkler trips. During site visits in both 1985 and 1987, Pond 6A was reported to contain approximately 16 inches of standing water, while Pond 6B was dry. Both ponds contained 12-18 inches of sediment which appeared to be soil.

The April 2002 RFI results indicated the presence of lead, NG, NC, and SVOCs in the soil.

ICM occurred in 2002 and consisted of removal of 1,300 cy of contaminated soil. Post excavation confirmation sampling found no contaminants above unrestricted levels.

Groundwater monitoring at SWMU 35 detected metals and SVOCs above industrial risk levels. Therefore LTM will continue to be conducted at SWMU 35.

LTM is planned and involves sampling three wells twice a year for four years. Contaminants to analyze for in the groundwater samples are metals, SVOCs, explosives, nitrate, ammonia, and sulfate.

CLEANUP/EXIT STRATEGY

LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-036
Site Name: N-Line Area
Alias: SWMU 36

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: MEDIUM

Contaminants of Concern: Dioxins/Dibenzofurans, Explosives, Metals, Pesticides, Polycyclic Aromatic Hydrocarbons (PAH), Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Sediment, Soil

Phases	Start	End
RFA	197909	199009
CS	199408	199805
RFI/CMS	199810	201408
DES	201410	201412
IRA	200707	201103
CMI(C)	201501	201508
LTM	201510	202508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises 301 acres in the south central portion of the installation. This area was used as to produce 2.75 inch rocket grains. The N-Line Press and Roll House Area operated from 1943 to 1946. The N-Line Finishing Area operated from 1943 to 1971 and was where the Army completed final machining and inspection of extruded and cut propellant grains. Off-spec materials and trimmings were sent to a grinding mill and then back to the north end of N-Line Area for re-blending. Wastewater originated primarily from floor and equipment washing and from deluge events (water used for fire suppression), and flowed through floor drains into underground sewer which discharged to unlined ditches that lead to Spoon Creek. There were 20 eastwardly trending ditches and six concrete settling sumps. Propellant solids containing NC and NG settled in these sumps, and trace amounts settled in the ditches. The propellant formulations processed in this area were double base and were generally reactive.

The April 1999 RFI identified propellant and lead in soil. Lead, NG, and TPH-GRO were found in groundwater. In 2001, subsequent to the initial RFI this site was increased by 248 acres due to a site-wide EBS in 1998.

Another RFI was required to investigate the additional 248 acres in the production area, and the area around monitoring well 008 in an attempt to identify the source of NG in that well. Visible propellant was observed in the production area. Also need to determine the extent of contamination in the two tunnel dryers used for calcium carbonate cake (CCC) storage, and the Jeep Shop leaking UST site (incorporated into SWMU 36 in 2002).

A total of 52,833 tons of contaminated soil under the AOC 23/24 ICM work plan at SWMU 36 were excavated and disposed of. An interim ICM completion report will be prepared.

An RFI work plan was prepared in October 2012, which was approved by KDHE. Fieldwork was never started due to insufficient funds.

RFI activities include collecting surface soil samples and surface drainage soil samples and selectively analyzing for RCRA metals, antimony, cobalt, manganese, nickel, explosives (including NC, NG, GN), SVOCs, VOCs, TPH-DRO, TPH-GRO, PCBs, pesticides, nitrate, ammonia, and sulfate. Surface soil samples will be collected from all RCRA non-explosive buildings biased toward potential release points such as doors and loading platforms. Surface soil samples will be collected every 500 ft along the portions of the wheeling walkways not sampled under the AOC 23 ICM. Surface drainage soil samples are proposed to characterize drainage ditches and swales. Samples will be collected at 500-feet increments in the ditches biased towards areas of accumulation or where visual evidence of contamination exists. Ten percent of the samples collected from drainage ditches extending away from accounts where pesticide drill holes are present will be analyzed for pesticides. The 17 existing groundwater monitoring wells will be sampled.

Site ID: SAAP-036
Site Name: N-Line Area
Alias: SWMU 36

Vertical delineation of contamination discovered during initial sampling will be performed using DPT. The exact number and locations of subsurface soil samples that will be collected will be determined based upon the analytical results for initial surface soil sampling activities. Groundwater grab samples will be collected from DPT bore holes if water is present. Surface water/sediment sample pairs are planned at water bodies that received storm water runoff from potentially contaminated areas. Groundwater monitoring wells will be installed and groundwater samples taken.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

LTM is planned and involves sampling 10 wells twice a year for 10 years. Contaminants to analyze for in the groundwater samples are RCRA metals, manganese, explosives (including NG and GN) VOCs, nitrate, and sulfate.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-037
Site Name: Sandblast Areas
Alias: SWMU 37

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: MEDIUM

Contaminants of Concern: Metals

Media of Concern: Soil

Phases	Start	End
RFA	197909	199009
CS	199509	199805
RFI/CMS	200001	201408
DES	201410	201412
CMI(C)	201501	201508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises three acres in the north central portion of the installation. This area was used for sandblasting metal. SAAP-037 is comprised of three separate areas. Sandblasting has reportedly occurred in an area around each of Buildings 245-3, 504, and 566-1. At building 566-1 sandblasting was used to prepare equipment such as motors, pumps, pipes, trailers, and heavy equipment for painting and preservation. At building 504 sandblasting was used to prepare metal signs for painting. The bulk of the sand recovered from sandblasting operations was disposed in the sanitary landfill after it was tested and was below TCLP levels; however, residual sand was left on the ground in each area. In addition, sand was not contained during the sandblasting operations and was therefore able to migrate through the air. The primary concerns at these sites are paint waste constituents, in particular metals such as arsenic, barium, chromium, cadmium, iron, lead, manganese, mercury, selenium and silver. PCBs were sometimes detected in some paints at low levels. Painting and de-painting solvents include VOCs.

The data from the March 2000 RFI were determined by the regulators to be unreliable (Intertek Testing Services Data).

An RFI work plan was prepared in April 2010, which was approved by KDHE. Field work was never started due to insufficient funds.

The RFI involves collection of surface soil samples and analyzing for RCRA metals, antimony, iron, manganese, SVOCs, VOCs, TPH-GRO, and PCBs. Groundwater monitoring wells will be installed and groundwater samples taken. The groundwater at sandblast area 37-2 located west of building 504 will be handled under SWMU 58.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for

an NFA determination. LTM is not anticipated at this site.

Site ID: SAAP-038
Site Name: Oil Water Separator
Alias: SWMU 38

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: HIGH

Contaminants of Concern: Metals, Pesticides

Media of Concern: Groundwater, Sediment, Soil, Surface Water

Phases	Start	End
RFA	197909	199009
CS	199509	199805
RFI/CMS	200001	200409
DES	201407	201408
CMI(C)	201410	201508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises one acre in the north central portion of the installation. This area was used to remove oil from Building 541 car wash wastewater prior to discharge to the sewage treatment plant. The Oil Water Separator began operation in 1971 to service the auto maintenance shop located in Building 541. A majority of the flow to the separator was derived from the floor drain in the car wash bay. Additional wastewater sources include rainwater and condensate from steam radiators used to heat the building. Although no oil or grease was reportedly dumped into the drains leading to the separator, a small quantity of sludge collected in the tank. Sludge was removed from the tank in 1987 and tested for TCLP prior to transfer to the Sanitary Landfill (SWMU 18). This was the first recorded removal of sludge. During a site visit in 1990, the integrity of the tank was questioned because there was influent to the separator, but the tank did not appear to be filling. Oil stains and bare ground were noted under and downgradient of the half tank. It was also indicated that there was visual evidence of potential release to the surface water and soil. In 1991 the half tank was cleaned up and removed. The contaminated soil underneath and surrounding the half tank was excavated and disposed. A new oil water separator (A541) was built and operated until 2001.

The March 2000 RFI yielded evidence of surface releases and potential tank leaks; however, the data from the March 2000 RFI were determined by the regulators to be unreliable (Intertek Testing Services Data).

The September 2005 RFI characterized surface soils around the previous tank location (400 square feet), below piping and concrete manifold (100 linear feet). The RFI also characterized the groundwater at discharge locations and within the migration pathway from the site. Minor impacts to soil, groundwater, surface water and sediment were confirmed.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. It is anticipated that there will be excavation of contaminated soils incidental to the closure of the separator system sumps, underground pipe between building 541 and A541, trough, and separator tank area. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for

an NFA determination. LTM is not anticipated at this site.

Site ID: SAAP-039
Site Name: South Acid Area Ditches
Alias: SWMU 39

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: MEDIUM

Contaminants of Concern: Dioxins/Dibenzofurans, Herbicides, Metals, Nitrate/Nitrite, Pesticides, Semi-volatiles (SVOC)

Media of Concern: Groundwater, Sediment, Soil

Phases	Start	End
RFA	197909	199009
CS	199509	199805
RFI/CMS	199602	201408
IRA	200807	201408
LTM	201410	202408

RIP Date: N/A

RC Date: 201408

SITE DESCRIPTION

This site comprises one acre in the east central portion of the installation. This area was used to convey contaminated wastewater from the South Acid Area. The primary central drainage ditch originates near the Calcium Cyanamide Disposal Area (SWMU 40). A second ditch originates from the northeast corner of the South Acid Area. A third influent ditch from the NG and paste mix areas joins the central ditch. All three ditches discharge into Pyotts Pond. During a site visit in 1990, the surface water observed in the central ditch was tinted orange; a white precipitate was observed along both the east and central ditches. Reportedly the orange color was caused by the neutralization of acidic ferrous sulfate and sulfuric acid with hydrated lime. The sediment was reported to contain ferrous sulfate and calcium sulfate. Wastes handled at this site include sulfuric and nitric acids, NC, and NG.

The data from the April 2000 RFI were determined by the regulators to be unreliable (Intertek Testing Services Data).

The September 2005 RFI found contamination in the drainage soil, sediment, surface water, and groundwater. Removal of contaminated drainage soil and sediment in the drainage ditches was recommended in the RFI report.

The ICM will be excavation of contaminated soils where there were exceedances of industrial TMCLs. Based on the results from previous studies, excavation of 1,830 linear feet of drainage ditches is planned due to industrial TMCL exceedances in the groundwater, so contaminant source removal in the ditches to residential levels is required. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

LTM is planned and involves sampling seven wells twice a year for ten years. Contaminants to analyze for in the groundwater samples are RCRA metals, beryllium, cobalt, fluoride, iron, manganese, SVOCs, nitrate, sulfate.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-040
Site Name: Calcium Cyanimide Disposal Area
Alias: SWMU 40

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: MEDIUM

Contaminants of Concern: Explosives, Metals

Media of Concern: Groundwater, Sediment, Soil, Surface Water

Phases	Start	End
RFA	197909	199009
CS	199408	199805
RFI/CMS	200001	201408
DES	201410	201412
CMI(C)	201501	201508
LTM	201510	202508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises two acres in the east central portion of the installation. This area was used for disposal of waste calcium cyanamide. During prove out of the of NG production process, calcium cyanamide sludge waste was disposed of within this fenced landfill, encompassing approximately. Aerial photographs identified that less than half of the site, or a 180 by 50 by 15 feet disposal area (located in the northeastern portion of the SWMU), was actually used for disposal of the waste. An evaporation pond located in the southwest portion of the SWMU eventually drains leachate and surface water runoff to Pyotts Pond, via the South Acid Area Drainage Ditch (SAAP-039). White and black stains have been observed along the edges of the evaporation pond.

The data from the May 2000 RFI were determined by the regulators to be unreliable (Intertek Testing Services Data).

An RFI work plan was prepared in January 2009, and was approved by KDHE. An RFI report will be prepared.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

The evaporative pond located in the southwest portion of the SWMU will require dewatering and sludge removal. The area of the evaporative pond is 5,016 square feet. The depth of sludge is one foot which makes 37,520 gallons of sludge that will need to be disposed as hazardous waste because the solid waste landfill will not accept liquid waste and KDHE has stated that liquid waste containing GN can no longer be disposed at a POTW. New bedrock wells need to be installed and sampled

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

LTM is planned and involves sampling six wells twice a year for ten years. Contaminants to analyze for in the groundwater samples are RCRA metals, aluminum, beryllium, cobalt, manganese, nickel, zinc, GN, NG, nitrate, sulfate, ammonia, pesticides, and pH.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for

an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-041
Site Name: Calcium Carbonate Cake Landfill
Alias: SWMU 41

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: MEDIUM

Contaminants of Concern: Nitrate/Nitrite, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater

Phases	Start	End
RFA	197909	199009
CS	199610	199805
RFI/CMS	199704	199808
DES	199810	199812
CMI(C)	199901	199905
CMI(O)	200107	204308

RIP Date: 200107

RC Date: 204308

SITE DESCRIPTION

This site comprises two acres in the west central portion of the installation. This area was used for disposal of CCC. The CCC Landfill measures 350 feet by 315 feet and was operated from May 1986 to June 1988. Between May 1988 and December 1991 the CCC was provided to farmers rather than landfilled. This practice was discontinued in December 1991 due to market saturation. Initially, containerized CCC was disposed of at this site, but later uncontainerized CCC was deposited. CCC is a byproduct of GN manufacturing. GN is an intermediate product of NQ. A leachate collection system was installed in the CCC Landfill at the time of construction. The leachate in the collection system tank is monitored. During a site visit in 1990 it was noted that the landfill cap was cracked, vegetative cover was sparse, and erosional features had developed. In 1998 the landfill cap was repaired and graded to minimize infiltration. Also, new ground cover was established to minimize erosion. All work was inspected and accepted by KDHE representatives.

Per KDHE's requirement additional wells were installed in 2002 to delineate the contaminated groundwater plume. Nitrates and sulfates are decreasing in the groundwater plume. Groundwater monitoring will continue.

LTM is planned and involves sampling seven wells twice a year for 30 years. Contaminants to analyze for in the groundwater samples are nitrate, sulfate, and GN. The landfill cap will be monitored and maintained. The landfill leachate will be monitored and disposed.

CLEANUP/EXIT STRATEGY

LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-042
Site Name: Temporary Sanitary Landfill
Alias: SWMU 42

STATUS

Parcel: NONE

Regulatory Driver: RCRA
RRSE: MEDIUM

Contaminants of Concern: Nitrate/Nitrite, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater

Phases	Start	End
RFA	197909	199009
CS	199610	199805
RFI/CMS	199602	200109
LTM	200110	204308

RIP Date: N/A

RC Date: 200109

SITE DESCRIPTION

This site comprises three acres in the south central portion of the installation. This area was used for disposal of sanitary waste. SAAP-042 is adjacent to (south of) SAAP-041, and was used to manage non-hazardous solid waste consisting of general trash and sanitary waste. CCC was initially landfilled in the first cell. However, that practice was discontinued. During the site visit in 1992 it appeared that the landfill consisted of three cells. Inspection and maintenance of the landfill cap is ongoing.

Since SAAP-041 and SAAP-042 landfills were contiguous there was one workplan and report for groundwater monitoring; however, KDHE stated in a comment letter to the 2010 LTM Report for SWMUs 41 and 42 that a separate groundwater sampling and analysis plan be submitted for SWMU 42 that includes monitoring for routine landfill analytes and site specific potential groundwater contaminants. Nitrates and sulfates are decreasing in the groundwater plume. LTM of groundwater is ongoing.

A groundwater sampling and analysis plan must be submitted to KDHE for SWMU 42 that includes monitoring for routine landfill analytes and site-specific potential groundwater contaminants. LTM is planned and involves sampling three wells twice a year for 20 years. Contaminants to analyze for in the groundwater samples are RCRA metals, manganese, SVOCs, VOCs, pesticides, and herbicides. Existing monitoring wells that would adequately work for SWMU 42 landfill groundwater monitoring are 042MW001 for the upgradient well, and 041MW001 and 041MW011 for the downgradient wells. The landfill cap will be monitored and maintained.

CLEANUP/EXIT STRATEGY

LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-043
Site Name: Tunnel Dryers (CCC Storage)
Alias: SWMU 43

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: MEDIUM

Contaminants of Concern: Explosives, Nitrate/Nitrite

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA	197909	199009
CS	199509	199805
RFI/CMS	199604	201408
DES	201410	201412
IRA	200610	201408
CMI(C)	201501	201508
LTM	201510	202008

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises eight acres in the west central and south east portion of the installation. This area was used to temporarily store CCC. There are six former tunnel dryers used for CCC storage. Four of the dryers are located in the west central portion of SFAAP. The two remaining dryers are located in the south east portion of SFAAP and were handled under AOC 23 at SAAP-036. The dryers began operation in 1986. Each dryer measures 125 feet by 18 feet, with 6 feet high walls, and each has a leachate collection system. CCC was a byproduct of the GN step of the NQ production process. The CCC was loaded into dump trucks via conveyor in the NQ area and transported to the tunnel dryers. The CCC was dumped into the dryer and arranged using a front end loader. The product was ultimately off loaded from the tunnel dryers by vendors for use by local farmers. The tunnel dryers are not enclosed. During a site visit in 1990, it was observed that CCC had been tracked beyond the walls of the tunnel dryers by the trucks loading and unloading at the site.

The data from the May 2000 RFI were determined by the regulators to be unreliable (Intertek Testing Services Data).

An RFI work plan was prepared in June 2010, which is awaiting approval from KDHE.

ICM for contaminated soil underneath explosive foundations is covered in the AOCs 23/24 ICM for SAAP-043.

The ICM (pre-AOC 23) involves collecting soil samples and sending to an off-site laboratory for analysis to horizontally delineate surface area of soil contamination around MEC foundations. One fixed-base laboratory sample will be collected every 30 linear around each MEC foundation. Additional samples are required for foundations that are not in exactly 30 linear feet increments. An estimated failure rate of 15 percent of these samples having contaminants above TMCLs requiring excavation then requires step out samples to horizontally delineate the surface soil contamination. Three surface samples bound each exceedance horizontally (the foundation bounds the fourth side). An estimated failure rate of five percent of the step out samples having contaminants above TMCLs requiring excavation then requires additional step out samples to horizontally delineate the surface soil contamination. Grids with TMCL exceedances will be excavated. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation.

RFI work involves surface soil samples to be collected and analyzed for RCRA metals, manganese, SVOC-phthalates, explosives (including NC, NG, NQ, GN), nitrate, sulfate, ammonia, and -pesticides. One new monitoring well will be installed and five groundwater samples taken (includes new well plus four existing wells).

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation

samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

LTM is planned and involves sampling five wells twice a year for five years. Contaminants to analyze for in the groundwater samples are RCRA metals, manganese, SVOC-phthalates, explosives (including NG, NQ, GN), nitrate, sulfate, ammonia, and pesticides.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-044
Site Name: Tank T784
Alias: SWMU 44

STATUS

Parcel: NONE

Regulatory Driver: RCRA
RRSE: MEDIUM

Contaminants of Concern: Metals

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA	197909	199009
CS	199509	199805
RFI/CMS	199604	201408
LTM	201410	202408

RIP Date: N/A

RC Date: 201408

SITE DESCRIPTION

This site comprises one acre in the northwest portion of the installation. This area was used to store NQ wastewater prior to discharge at SAAP-002. SAAP-044 consists of Tank T784. Limited production began in the NQ Area in 1981. Full production occurred from 1984 to 1992. Tank T784, also known as Account 9049, was a vertical steel aboveground wastewater collection tank which held cooling tower blowdown water, NQ crystallizer condensate, GN evaporator condensate, and non-contact cooling water. A pipe discharged the wastewater from Tank T784 into the RWTP Lagoons (SWMU 2), via an underground transfer line. This pipe follows the north plant boundary before turning directly north towards the lagoons. Several releases had occurred as a result of breaks in the RWTP Lagoon transfer line. Tank overflows had also occurred. There were no spill containment structures for the tank.

The data from the June 2000 RFI were determined by the regulators to be unreliable (Intertek Testing Services Data).

The March 2005 RFI found no contamination in the soil above industrial TMCLs. The RFI report recommended NFA for soil, and was approved by KDHE.

A request for NFA was written by the Army and sent to KDHE in June 2007. In a letter dated February 5, 2009 KDHE denied the NFA request. KDHE requested action on two subsurface arsenic exceedances of the residential TMCL, but both are below the industrial TMCL. One groundwater sample exceeded the industrial TMCL for arsenic; therefore LTM of four groundwater monitoring wells is recommended. Sampling of the underground discharge line may be required due to reported spills.

LTM is planned and involves sampling four wells twice a year for ten years. Contaminants to analyze for in the groundwater samples are RCRA metals, manganese, nitrates, sulfates, GN, NQ, and VOCs. The existing wells for SWMU 44 are 044MW001, 044MW001A, 047MW014A, 047MW014B.

CLEANUP/EXIT STRATEGY

LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-045
Site Name: Bldg 9040 & Ca. Cyanamide Conveyor
Alias: SWMU 45

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: MEDIUM

Contaminants of Concern: Explosives, Metals, Nitrate/Nitrite, Semi-volatiles (SVOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA	197909	199009
CS	199610	199805
RFI/CMS	200001	201408
LTM	201410	202408

RIP Date: N/A

RC Date: 201408

SITE DESCRIPTION

This site comprises two acres in the north west portion of the installation. This area was used for moving and storing calcium cyanamide, and production of GN. The NQ Area had limited production in 1981 (proveout), and full production from 1984 to 1992. Calcium cyanamide was produced in Building 9004 and transferred via belt conveyor to Building 9040 for use in the GN production process. The belt conveyor, which lead to storage bins located on the east side of Building 9040, was enclosed in an elevated, sheet metal galley way. There were four 175-ton storage bins. Calcium cyanamide was released at the bins because of problems with the screw conveyors used to transport material from Building 9004. A concrete pad was constructed in a small portion of the area under the storage bins; however, the pad was too small to effectively contain the spillage, especially in windy conditions. Bare spots were observed in areas near the storage bins. A drainage divide is located in the NQ Area running north of Building 9040. It separates the Captain Creek drainage area from the area drained by unnamed creeks flowing northward toward the Kansas River.

The data from the November 2000 RFI were determined by the regulators to be unreliable (Intertek Testing Services Data).

The August 2005 RFI indicates that the nitrate plume is not leaving SFAAP. A baseline screening risk assessment was performed to evaluate the risk from soil contamination. The results indicate that the soil under and around the conveyors and bins does not contain any contaminants above unrestricted levels. Contaminated soil was found around the sumps at building 9040, but the sumps will be remediated under SAAP-047. After the source is removed (building 9040 sumps) groundwater monitoring will be conducted.

After the nitrate source is removed (building 9040 sumps), LTM is planned and involves sampling 12 wells twice a year for ten years. Contaminants to analyze for in the groundwater samples are RCRA metals, manganese, SVOCs, VOCs, and nitrate.

CLEANUP/EXIT STRATEGY

LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-046
Site Name: Decontamination Oven
Alias: SWMU 46

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: MEDIUM

Contaminants of Concern: Dioxins/Dibenzofurans, Metals

Media of Concern: Soil

Phases	Start	End
RFA	197909	199201
CS	199509	199805
RFI/CMS	200001	201408
DES	201410	201412
IRA	200610	201408
CMI(C)	201501	201508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises two acres in the northeast portion of the installation. This area was used to decontaminate oversized equipment/materials contaminated with trace explosives. The oven was constructed in 1970 and was used until 2001. There were no secondary containment features at this site. Only trace explosives were treated in this area. It may have been possible for volatile organic contaminants to be released via the exhaust fan during heating. Lead may have been released from the equipment and vehicles decontaminated at this site.

The data from the April 2000 RFI were determined by the regulators to be unreliable (Intertek Testing Services Data).

An RFI work plan was prepared in February 2008, and was approved by KDHE. Fieldwork is complete. Dioxin and lead were found in surface soil above industrial levels. An RFI report was prepared in January 2011, which is awaiting approval from KDHE.

ICM for contaminated soil underneath explosive foundations is covered in the AOCs 23/24 ICM for SAAP-046.

The ICM (pre-AOC 23) involves collecting soil samples and sending to an offsite laboratory for analysis to horizontally delineate surface area of soil contamination around MEC foundations. One fixed-base laboratory sample will be collected every 30 linear around each MEC foundation. Additional samples are required for foundations that are not in exactly 30 linear feet increments. An estimated failure rate of 15 percent of these samples having contaminants above TMCLs requiring excavation then requires step out samples to horizontally delineate the surface soil contamination. Three surface samples bound each exceedance horizontally (the foundation bounds the fourth side). An estimated failure rate of five percent of the step out samples having contaminants above TMCLs requiring excavation then requires additional step out samples to horizontally delineate the surface soil contamination. Grids with TMCL exceedances will be excavated. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (1 per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

Site ID: SAAP-046
Site Name: Decontamination Oven
Alias: SWMU 46

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is not anticipated at this site.

Site ID: SAAP-047
Site Name: Nitroguanidine Area (25) Sumps
Alias: SWMU 47

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: HIGH

Contaminants of Concern: Explosives, Metals, Nitrate/Nitrite, Semi-volatiles (SVOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA	197909	199009
CS	199408	199805
RFI/CMS	199810	201408
DES	201410	201412
IRA	199810	201408
CMI(C)	201501	201508
LTM	201510	202508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises one acre in the northwest portion of the installation. This area was used to collect wastewater from each of the NQ Production Area buildings/tanks. SAAP-047 consists of 25 sumps. Construction of the NQ Production facilities began in the late-1970s with limited production during 1981 (proveout). In August 1984, the plant began bulk production of NQ, producing 63 million pounds through August 1992. Each of the production buildings had dedicated sumps outside the buildings which received wastewater generated by operations in the NQ Area. The wastewater resulted from equipment wash downs and spills. The wastewater may have been acidic and may potentially have contained contaminants such as NQ and GN, as well as raw process materials or intermediates of the NQ production process.

The May 1999 RFI results indicate elevated levels of nitrates in groundwater and the soil around the sumps in the NQ Production Area. Another RFI is required to confirm vertical and horizontal extent of contamination.

An RFI work plan was prepared in May 2010, which is awaiting approval by KDHE.

ICM for contaminated soil underneath explosive foundations is covered in the AOCs 23/24 ICM for SAAP-047.

The RFI involves collecting soil and sediment samples at potential release points. An estimated failure rate of 15 percent of these samples having contaminants above TMCLs requiring excavation then requires step out samples to horizontally delineate the surface soil contamination. Three surface samples bound each exceedance horizontally (the foundation bounds the fourth side). An estimated failure rate of five percent of the step out samples having contaminants above TMCLs requiring excavation then requires additional step out samples to horizontally delineate the surface soil contamination.

Vertical delineation of contamination discovered during initial sampling will performed using DPT. The exact number and locations of subsurface soil samples that will be collected will be determined based upon the analytical results for initial surface soil sampling activities.

The ICM (does not include removal and remediation of the 25 sumps) will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. Grids with TMCL exceedances will be excavated. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

The ICM (pre-AOC 23) involves collecting soil samples and sending to an offsite laboratory for analysis to horizontally delineate surface area of soil contamination around MEC foundations. One fixed-base laboratory sample will be collected every 30 linear

around each MEC foundation. Additional samples are required for foundations that are not in exactly 30 linear feet increments. An estimated failure rate of 15 percent of these samples having contaminants above TMCLs requiring excavation then requires step out samples to horizontally delineate the surface soil contamination. Three surface samples bound each exceedance horizontally (the foundation bounds the fourth side). An estimated failure rate of five percent of the step out samples having contaminants above TMCLs requiring excavation then requires additional step out samples to horizontally delineate the surface soil contamination. Grids with TMCL exceedances will be excavated. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

LTM is planned and involves sampling five wells twice a year for five years. Contaminants to analyze for in the groundwater samples are RCRA metals, manganese, GN, NQ, VOCs, perchlorates (only at lab), nitrate, sulfate, and ammonia.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-048
Site Name: Nitroguanidine Support Area
Alias: SWMU 48

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: LOW

Contaminants of Concern: Explosives, Nitrate/Nitrite

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA	197909	199009
CS	199408	199805
RFI/CMS	199609	201408
IRA	200610	201408
LTM	201410	201908

RIP Date: N/A

RC Date: 201408

SITE DESCRIPTION

This site comprises six acres in the north central portion of the installation. This area was used to proveout the NQ production process. SAAP-048 consists of the NQ Support Equipment (NSE) Area located in the in Buildings 2000 and 2012. The equipment included dryer bays, ASTs, and half tanks. The NSE was a NQ pilot-scale production plant that was constructed during 1977-1980 and operated periodically as a partial proveout of the NQ production process from May 1979 to June 1984. In August 1984, the main NQ plant began production. The majority of the pilot plant was demolished sometime following shut down. This site was formerly the location of the 2000 series NC production facility, used from 1943 to 1946. The NC production equipment was removed and the NSE was built in the empty buildings.

The May 1999 RFI results indicated the presence of elevated levels of nitrates, NQ, GN and sulfates in the soil and groundwater.

Monitoring of groundwater will continue due to historic exceedances.

ICM for contaminated soil underneath explosive foundations is covered in the AOCs 23/24 ICM for SAAP-048.

The ICM (pre-AOC 23) involves collecting soil samples and sending to an off-site laboratory for analysis to horizontally delineate surface area of soil contamination around MEC foundations. One fixed-base laboratory sample will be collected every 30 linear around each MEC foundation. Additional samples are required for foundations that are not in exactly 30 linear feet increments. An estimated failure rate of 15 percent of these samples having contaminants above TMCLs requiring excavation then requires step out samples to horizontally delineate the surface soil contamination. Three surface samples bound each exceedance horizontally (the foundation bounds the fourth side). An estimated failure rate of five percent of the step out samples having contaminants above TMCLs requiring excavation then requires additional step out samples to horizontally delineate the surface soil contamination. Grids with TMCL exceedances will be excavated. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

LTM is planned and involves sampling five wells twice a year for five years. Contaminants to analyze for in the groundwater samples are RCRA metals, manganese, VOCs, GN, NQ, nitrates, and sulfates.

CLEANUP/EXIT STRATEGY

Site ID: SAAP-048
Site Name: Nitroguanidine Support Area
Alias: SWMU 48

[redacted]

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-050
Site Name: Disposal Site East of SWMU 1
Alias: SWMU 50

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: HIGH

Contaminants of Concern: Metals, Polycyclic Aromatic Hydrocarbons (PAH)

Media of Concern: Soil

Phases	Start	End
RFA	197909	199009
CS	199408	199805
RFI/CMS	199910	200105
IRA	199703	199907
LTM	200106	204308

RIP Date: N/A

RC Date: 200105

SITE DESCRIPTION

This site comprises 10 acres in the northeast portion of the installation. This area was used for disposal of building demolition debris. SAAP-050 consists of two areas. The first area (SWMU 50 north) is an abandoned dump site (6.5 acres) that was discovered just inside the eastern boundary of SFAAP near Kill Creek. The second area (SWMU 50 south) consists of another abandoned dump site (3.2 acres) south of the other area. The debris scattered about both sites included broken asbestos (transite) siding, shingles, asbestos pipe insulation, bricks, vitrified clay pipe, drums and metal slag.

The February 1997 RFI indicated that the abandoned dump site did not exhibit unacceptable carcinogenic or toxic risks for the projected future land use of a trail through the area for Johnson County Parks and Recreation. Because the exposed friable asbestos and some carcinogenic risk to recreational visitors, and that both dump sites are located in a flood plain, KDHE and USEPA requested that interim measures be taken to remove the debris including all visible asbestos containing material (ACM).

In 1997 an interim removal action (IRA) was executed. SWMU 50 south had 790 tons of ACM and debris, and 11 cy on non-hazardous lead-impacted soil excavated and disposed off-site. The stream bank was stabilized with rock riprap for 100 feet to prevent further erosion of the disposal area.

In 1999 another IRA was executed. SWMU 50 north had 1,790 tons of ACM and debris excavated and disposed off-site. The stream bank was stabilized with rock riprap for 140 feet to prevent further erosion of the disposal area.

Cover monitoring and maintenance will continue. In 2004 limited debris removal and cover stabilization (riprap) was conducted as part of LTM.

Small quantities of exposed ACM have been found each year from stream bank erosion. Future stabilization of the stream bank will be required.

LTM will continue for 30 years and involves an annual inspection of the soil cover and rip-rap, and picking up any asbestos that has washed from the disposal area into the creek. Occasional repair of eroded areas of the soil cover will be required. Four stabilization events are anticipated which may include rip-rap of eroded stream bank or adding soil cover outside the stream to cover eroded disposal area.

CLEANUP/EXIT STRATEGY

LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will

be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-051
Site Name: New Reclamation Yard
Alias: SWMU 51

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: MEDIUM

Contaminants of Concern: Metals

Media of Concern: Soil

Phases	Start	End
RFA	197909	199009
CS	199408	199805
RFI/CMS	200001	201408
DES	201410	201412
CMI(C)	201501	201508
LTM	201510	202008

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises eight acres in the north central portion of the installation. This area was used to stage scrap materials and excess equipment. SAAP-051 consists of the New Reclamation Yard, commonly referred to as the Salvage Yard. This site also includes the battery handling area. Scrap was flash decontaminated at the Contaminated Materials Burning Ground (SWMU 21) prior to disposition. In the battery handling area, decomposed battery parts were observed on the ground. Typical wastes associated with batteries include acids and metals (mercury, lead and cadmium). SAAP-051 initially was just the battery handling area, but was expanded to include all of the Salvage Yard due to the 1998 site-wide EBS which identified the remainder of the Salvage Yard as an AOC.

The data from the June 1997 RFI were determined by the regulators to be unreliable (Intertek Testing Services Data).

An RFI work plan was prepared in October 2009, and was approved by KDHE. Fieldwork was started but was stopped due to insufficient funds.

Finishing the RFI entails collecting surface soil samples at locations of potential contamination. Surface drainage soil samples will be collected from the drainage ditches in the vicinity of SWMU 51. Soil samples will be analyzed for RCRA metals, antimony, beryllium, copper, hexavalent chromium, manganese, SVOCs, VOCs, PCBs, nitrate, sulfate, ammonia, TPH-DRO, TPH-GRO, and pH.

Horizontal and vertical delineation of contamination discovered during initial sampling will be performed and involves soil stepout samples and subsurface soil samples. Groundwater grab samples will be collected using DPT soil bore holes. Groundwater monitoring wells will be installed and sampled.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

LTM is planned and involves sampling four wells twice a year for five years. Contaminants to analyze for in the groundwater

samples are RCRA metals, antimony, beryllium, copper, hexavalent chromium, manganese, SVOCs, VOCs, PCBs, nitrate, sulfate, ammonia, TPH-DRO, TPH-GRO, and pH.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-052
Site Name: Paint Bay Building 542
Alias: SWMU 52

STATUS

Parcel: NONE

Regulatory Driver: RCRA
RRSE: MEDIUM

Contaminants of Concern: Metals

Media of Concern: Soil

Phases	Start	End
RFA	197909	199201
CS	199201	199805
RFI/CMS	199602	201408

RIP Date: N/A

RC Date: 201408

SITE DESCRIPTION

This site comprises one acre in the north central portion of the installation. This area was used to paint vehicles. SAAP-052 consists of the paint bay within Building 542. Fumes and overspray were vented through the east side of the building where stressed vegetation has been observed. Wastes typically associated with paint bays include volatile organics and metals such as chromium, cadmium and lead.

The data from the March 2000 RFI were determined by the regulators to be unreliable (Intertek Testing Services Data).

The February 2005 RFI indicated no detections of contamination above residential TMCLs. The RFI recommended NFA and was approved by KDHE.

A request for NFA was written by the Army and sent to KDHE in April 2007. In a letter dated January 23, 2009 KDHE denied the NFA request based on data gaps KDHE found in the RFI report.

To fill the data gap two groundwater monitoring wells will be installed and groundwater samples analyzed for RCRA metals, manganese, SVOC-phthalates, and VOCs.

CLEANUP/EXIT STRATEGY

The RFI is expected to demonstrate no risk at the site and allow for an NFA determination.

Site ID: SAAP-053
Site Name: Burn and Debris Area North of STP
Alias: SWMU 53

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: HIGH

Contaminants of Concern: Dioxins/Dibenzofurans, Metals

Media of Concern: Soil

Phases	Start	End
RFA	199601	199604
CS	199704	199811
RFI/CMS	200310	201408
DES	201410	201412
CMI(C)	201501	201508
LTM	201510	202008

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises five acres in the northeast portion of the installation. This area was used for open burning non-explosive debris. Aerial photographs taken of SFAAP from 1948 to 1991 show the old burn and debris area. An inspection was done on Sept. 18, 1997. A wood pile is still there, but the road is covered over with vegetation. The debris begins around the fence line near the main road by the sewage treatment plant. SAAP-053 is comprised of construction debris including heavy duty concrete rubble, rusted out 55-gallon steel drums, glass rubble, broken insulators, pipe debris, wood scraps, telephone poles, wire fencing, concrete pipe pieces, iron scraps and asbestos materials. The debris covers one acre and extends from the fence line, following the ditch until reaching the open area where a quarry existed. Debris is on both sides of the ditch and in the ditch.

In November 1998, an RRSE was completed.

The May 2006 RFI results indicated there were 10 soil sample exceedances of industrial TMCLs at eight sampling locations.

A CMS for SWMU 53 was prepared in March 2011 and is awaiting approval by KDHE.

The corrective measures will be excavation of contaminated soils where there were exceedances of Industrial TMCLs. Additional site characterization is required prior to excavation to find and delineate any contaminated soil above Industrial TMCLs. Soil samples will be collected and sent to an off-site laboratory for analysis to horizontally delineate surface area of soil contamination in the two burn areas, the historical disposal area, and the drainage ditch. One fixed-base laboratory sample will be collected every 900 square feet in the two burn areas and the historical disposal area. Additional samples are required for ditch drainage soil/sediment characterization. The initial soil samples will be analyzed for RCRA metals, manganese, SVOCs, VOCs, PCBs, and dioxins. An estimated failure rate of 30 percent of these samples having contaminants above TMCLs requiring excavation then requires step out samples to horizontally delineate the surface soil contamination. Three surface samples bound each exceedance horizontally (the contaminated area is the fourth side). An estimated failure rate of 10 percent of the step out samples having contaminants above TMCLs requiring excavation then requires first additional step out samples to horizontally delineate the surface soil contamination. An estimated failure rate of five percent of the first additional step out samples having contaminants above TMCLs requiring excavation then requires second additional step out samples to horizontally delineate the surface soil contamination. An estimated failure rate of 25 percent of the excavation grids will require re-remediation.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

Site ID: SAAP-053
Site Name: Burn and Debris Area North of STP
Alias: SWMU 53

LTM is planned and involves sampling four wells twice a year for five years. Contaminants to analyze for in the groundwater samples are RCRA metals, manganese, SVOCs, VOCs PCBs, dioxins.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-054
Site Name: Fluorescent Tube Wells
Alias: SWMU 54

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: MEDIUM

Contaminants of Concern: Metals

Media of Concern: Soil

Phases	Start	End
RFA	199601	199604
CS	199704	199811
RFI/CMS	200310	201408

RIP Date: N/A

RC Date: 201408

SITE DESCRIPTION

This site comprises one acre in three areas of the installation. These areas were used for disposal of fluorescent light bulbs. The sites consisted of two hand dug water wells and one cistern that were part of old pre-SFAAP homesteads. It is uncertain when the disposal occurred, but is suspected to have taken place prior to 1976. Fluorescent tubes contain mercury. The broken fluorescent tubes and contaminated soil were removed from all three wells. All three wells were closed in accordance with KDHE well abandonment requirements in 1998. The following is a description of each Fluorescent Tube Well (FTW) and the actions taken at each well.

FTW-1 was located in the east central part of SFAAP, south of AOC 5, 1,000 feet east of Spoon Creek. The former FTW-1 was a rectangular rock-lined well with interior dimensions of four feet by three feet and a depth of 15 feet. FTW-1 was closed in 1998 in accordance with KDHE well-abandonment requirements. Prior to closure two 55-gallon drums of fluorescent light tubes, incandescent light bulbs, and debris were removed from the well and disposed offsite as hazardous waste. During closure a pit of eight feet by 11 feet at the surface tapering down to six feet by five feet at a depth of 16 feet below ground surface was excavated. A total of 8.9 cy of soil, rock, and debris was excavated and disposed off-site at the Johnson County Landfill as nonhazardous special waste.

FTW-2 was located in the northeast part of SFAAP, southeast of SWMU 56, 2,300 feet east of Kill Creek. The former FTW-2 was a round rock-lined 6 feet diameter round well eight feet deep. FTW-2 was closed in 1998 in accordance with KDHE well-abandonment requirements. Prior to closure half of a 55-gallon drum of fluorescent light tubes, incandescent light bulbs, and debris were removed from the well and disposed offsite as hazardous waste. During closure a pit of 15 feet by 15 feet at the surface tapering down to six feet by five feet at a depth of 11 feet below ground surface was excavated. A total of 8.5 cy of soil, rock, and debris was excavated and disposed off-site at the Johnson County Landfill as nonhazardous special waste.

FTW-3 is located in the north central part of SFAAP, west of SWMU 65. FTW-3 is a round brick and concrete-lined five feet diameter round cistern 14 feet deep. Six and one half 55-gallon drums of fluorescent light tubes, incandescent light bulbs, and soil/water slurry were removed from the cistern and disposed off-site as hazardous waste.

In November 1998 an RRSE was completed.

An RFI work plan was prepared in April 2009, and was approved by KDHE. Tetra Tech took 23 soil samples and analyzed for beryllium, lead, and mercury. Soil samples did not exceed residential TMCLs. Three groundwater monitoring wells were installed at FTW-3 and five groundwater samples were collected. Groundwater samples did not exceed residential TMCLs. Attempts were made to install groundwater monitoring wells at FTW-1 and FTW-2, but groundwater was not present. An RFI report will be prepared.

The ICM work to close these farmstead wells was funded by non-ER,A funds and therefore is not shown in the phase schedule. Since the homestead wells were closed in accordance with KDHE well abandonment requirements, and no impact to soil or

groundwater was found, NFA is required. After KDHE approval of the RFI report, a SOB for NFA will be prepared.

CLEANUP/EXIT STRATEGY

The RFI is expected to demonstrate no risk at the site and allow for an NFA determination.

Site ID: SAAP-057
Site Name: Chemical Preparation House
Alias: SWMU 57

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: LOW

Contaminants of Concern: Metals, Pesticides

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA	199808	200303
CS	200303	200309
RFI/CMS	200904	201408
DES	201410	201412
CMI(C)	201501	201508
LTM	201510	201808

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises one acre in the north central portion of the installation. This area was used for storing and preparing non-explosive chemicals for mixing with explosive to make propellant paste. SAAP-057 consists of the Chemical Preparation House (Facility 507-2). Chemicals may have been spilled on the ground outside of this building.

This site is located in Parcel 1-27(7)HR(P) as shown in the 1998 site-wide EBS.

The March 2003 RRSE results showed that there were no exceedances of background levels. The RRSE report recommended NFA at this site. However, KDHE wrote a letter recommending the Army conduct additional soil and groundwater sampling.

An RFI work plan that was prepared in April 2009, and was approved by KDHE. Field sampling is complete. Sampling results showed one soil exceedance of the industrial TMCL for lead, and two exceedances of groundwater samples at one monitoring well of the industrial TMCL for dieldrin. An RFI report will be prepared.

The corrective measures will be excavation of contaminated soils where there was one exceedance of the industrial TMCL for lead. The Army does not clean up applied pesticides. The excavation grid size is 900 square feet.

LTM is planned and involves sampling one well twice a year for three years. Contaminant to analyze for in the groundwater samples is dieldrin.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-058
Site Name: Combined Shops Area
Alias: SWMU 58

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: HIGH

Contaminants of Concern: Metals, Polycyclic Aromatic Hydrocarbons (PAH)

Media of Concern: Soil

Phases	Start	End
RFA	199808	200303
CS	199808	200303
RFI/CMS	200303	201408
DES	201410	201412
CMI(C)	201501	201508
LTM	201510	202008

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises 14 acres in the north central portion of the installation. This area was used for maintenance activities and repairs. There are a total of 30 facilities in the area. The facilities include: three offices, the fuel unloading station, storage and distribution center, 12 storehouses, and nine shops. There was a Tram Repair Shop that was converted into a Heating Plant. Shops in this area include: Paint and Sign, Paint, Tool Control/Millwright, Forge and Weld, Lead Burning, Heavy Equipment Repair, Area Oil House, Locomotive Repair, and Tram Repair Shops. Building 500 contained the following shops: Carpenter, Electrical Instrument, Refrigeration Air Conditioner, Pipe, and Machine shops.

This site is located in Parcel 1-28(7)HR(P) shown in the 1998 Site-wide EBS.

The results from the March 2003 RRSE report indicate that PCE in the groundwater exceeded the USEPA Region IX preliminary remediation goals (PRGs). PCE, PAHs, lead, arsenic and manganese results from soil exceeded the USEPA Region IX PRGs.

An RFI work plan that was prepared in April 2010, and was approved by KDHE. Fieldwork was not started due to insufficient funds.

RFI activities include collecting surface soil samples at locations of potential contamination. Surface drainage soil samples will be collected from the drainage ditches in the vicinity of SWMU 58. Soil samples will be analyzed for RCRA metals, antimony, beryllium, cobalt, manganese, SVOCs, VOCs, PCBs, TPH-DRO, TPH-GRO, nitrate, sulfate, ammonia, and pH. Horizontal and vertical delineation of contamination discovered during initial sampling will be performed and involves soil stepout samples and subsurface soil samples. Groundwater grab samples will be collected using DPT soil bore holes. Groundwater samples will be collected from existing monitoring wells. Groundwater monitoring wells will be installed and groundwater samples collected.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

LTM is planned and involves sampling four wells twice a year for five years. Contaminants to analyze for in the groundwater samples are RCRA metals, antimony, beryllium, cobalt, manganese, SVOCs, VOCs, PCBs, TPH-DRO, TPH-GRO, nitrate, sulfate,

ammonia, and pH.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-059
Site Name: Laundry Facility
Alias: SWMU 59

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: LOW

Contaminants of Concern: Explosives, Metals

Media of Concern: Soil

Phases	Start	End
RFA	199808	200303
CS	200303	200309
RFI/CMS	200912	201408
DES	201410	201412
IRA	200610	201408
CMI(C)	201501	201508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises 55 acres in the north central portion of the installation. This area was used to launder worker clothing to remove process wastes and propellant residues. SAAP-059 consists of the Laundry Facility (Building 4562) which was a single story facility with a concrete floor containing several sumps and drains. There were two fuel oil tanks located outside of the facility.

This site is located in Parcel 1-30(7)HR(P) shown in the 1998 Site-wide EBS.

The results from the March 2003 RRSE report indicate that all the soil samples were below USEPA Region IX PRGs. The RRSE report recommended NFA at this site; however, KDHE wrote a letter recommending the Army conduct additional soil and groundwater sampling.

An RFI work plan was prepared in December 2009, and was approved by KDHE in December 2009. Fieldwork is complete. There were three soil exceedances of the industrial TMCL for GN. There were no exceedances of groundwater samples at two monitoring wells at SWMU 59. An RFI report will be prepared.

ICM for contaminated soil underneath explosive foundations is covered in the AOCs 23/24 ICM for SAAP-059.

The ICM (pre-AOC 23) involves collecting soil samples and sending to an offsite laboratory for analysis to horizontally delineate surface area of soil contamination around MEC foundations. One fixed-base laboratory sample will be collected every 30 linear around each MEC foundation. Additional samples are required for foundations that are not in exactly 30 linear feet increments. An estimated failure rate of 15 percent of these samples having contaminants above TMCLs requiring excavation then requires step out samples to horizontally delineate the surface soil contamination. Three surface samples bound each exceedance horizontally (the foundation bounds the fourth side). An estimated failure rate of five percent of the step out samples having contaminants above TMCLs requiring excavation then requires additional step out samples to horizontally delineate the surface soil contamination. Grids with TMCL exceedances will be excavated. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet. Confirmation samples will be analyzed for RCRA metals, manganese, SVOCs, VOCs, explosives (including NC, NG, NQ, GN), TPH-DRO, nitrate, and ammonia.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and

stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is not anticipated at this site.

Site ID: SAAP-062
Site Name: Transformer Storage Warehouse 566-5
Alias: SWMU 62

STATUS

Parcel: NONE

Regulatory Driver: RCRA
RRSE: LOW

Contaminants of Concern: Polychlorinated Biphenyls (PCB)

Media of Concern: Soil

Phases	Start	End
RFA	199808	200303
CS	199808	200303
RFI/CMS	200303	201408
DES	201410	201412
CMI(C)	201501	201508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises one acre in the north central portion of the installation. This area was used for temporary storage of non-Toxic Substances Control Act (TSCA) regulated (less than 50 parts per million [ppm] PCBs) transformers. This site is located in Parcel 1-34(7)HR(P)/PR(P) shown in the 1998 site-wide EBS. At the time of the EBS, this facility stored 149 replacement transformers. Based on visual inspections, several stains were observed on the concrete floor, and some of the transformers that were currently stored in the facility were observed to be leaking. The facility was considered a potential AOC. All of the transformers stored were tested for PCB content and all were below 50 ppm; however, labels were lacking on some of the transformers. It was impossible to determine if all the stains noted were caused by the transformers currently stored or by transformers previously stored at the facility.

An RRSE was conducted in March 2003 for the area outside of building 566-5.

A CERCLA remediation using TSCA as an applicable or relevant and appropriate requirement (ARAR) was conducted in 2004. The investigation and cleanup was done under TSCA regulations. SWMU 62 measures 101 feet by 39 feet for an area of 3,939 square feet. A total of 490 tons of PCB contaminated concrete, gravel, and soil was excavated and disposed of. All remaining soil in SAAP-102 was below unrestricted levels for PCBs (1 mg/kg) as reported in the Polychlorinated Biphenyl Sites Cleanup Report (September 2007). This ICM work was funded with non-ER,A funds and therefore is not shown in the phase schedule.

A request for NFA was written by the Army and sent to KDHE in February 2008. In a letter dated March 12, 2009 KDHE denied the NFA request based on data gaps KDHE found in the Polychlorinated Biphenyl Sites Cleanup Report (September 2007).

Additional investigation and cleanup is required to close the data gaps identified in KDHE's letter dated March 12, 2009.

The RFI involves the following estimated soil samples necessary to close the data gaps identified by KDHE. Surface soil samples will be collected in the outside transformer storage areas on the east and west sides of Building 566-5. Surface soil samples will be collected on the inside of the foundation of Building 566-5. These samples will be analyzed for SVOC-PAHs, VOC, TPH-DRO, TPH-GRO, pesticides, and herbicides. Horizontal and vertical delineation of contamination discovered during initial sampling will be performed and involves soil stepout samples and subsurface soil samples.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal

as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is not anticipated at this site.

Site ID: SAAP-063
Site Name: Water Towers
Alias: SWMU 63

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: LOW

Contaminants of Concern: Metals

Media of Concern: Soil

Phases	Start	End
RFA	199808	200303
CS	199808	200303
RFI/CMS	200303	201408
DES	201410	201412
CMI(C)	201501	201508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises seven acres in several areas of the installation. This area was used to store water. SAAP-063 consists of the two sets of Water Towers: North Towers and South Towers. The north towers consist of towers 127- 1, 127- 2, 127- 3 and 127- 4 positioned in a row (north to south), located at the plant main entrance, at the north center boundary of the facility. The south towers consist of four independent towers located independent of one another within the central manufacturing area of the plant. The south towers are 127-5, 128-3, 128-8, and 130-4. Water towers 129-3 and 130-4 are being handled under AOC 16 since they both are within AOC 16 boundary. All of the towers have undergone substantial surface sandblasting and restoration actions, which have resulted in lead contamination of surrounding surface soils from sandblasting lead-based paint.

This site is located in Parcel 1-35(7)HR(P) shown in the 1998 site-wide EBS.

In the March 2003 RRSE, arsenic and lead results exceeded USEPA Region IX PRGs.

An RFI work plan was prepared in February 2009, and was approved by KDHE. Fieldwork is complete. There were 28 soil exceedances of the industrial TMCL for lead. There were no exceedances of Residential TCMLs for sediment, surface water, and groundwater at SWMU 63. An RFI report will be prepared.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet. Confirmation samples will be analyzed for lead.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is not anticipated at this site.

Site ID: SAAP-064
Site Name: Paper Burning Ground
Alias: SWMU 64

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA

RRSE: LOW

Contaminants of Concern: Dioxins/Dibenzofurans, Metals, Volatiles (VOC)

Media of Concern: Sediment, Soil

Phases	Start	End
RFA	199808	200303
CS	199808	200303
RFI/CMS	200303	201408
DES	201410	201412
CMI(C)	201501	201508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises three acres in the east central portion of the installation. This area was used to burn paper. A trench was observed on aerial photographs encompassing approximately 200 feet by 30 feet. Contaminants may have extended to a depth of five feet below ground surface (depth to bedrock).

This site is located in Parcel 1-38(7)HR(P) shown in the 1998 site-wide EBS.

In the March 2003 RRSE, arsenic results in the soil exceeded the USEPA Region IX PRGs. The soil results were used to estimate the potential levels of compounds in groundwater. Arsenic, chromium and lead were estimated for groundwater as exceeding the USEPA Region IX PRGs.

An RFI work plan was prepared in February 2009, and was approved by KDHE. Fieldwork is complete. There were 24 soil exceedances of TMCLs at 10 sample locations. There were no exceedances of residential TCMLs for sediment, surface water, and groundwater at SWMU 64. An RFI report will be prepared.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet. Confirmation samples will be analyzed for metals, dioxins, SVOCs, VOCs, TPH-DRO.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is not anticipated at this site.

Site ID: SAAP-065
Site Name: Tank Farm
Alias: SWMU 65

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: LOW

Contaminants of Concern: Metals

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA	199808	200303
CS	199808	200303
RFI/CMS	200303	201408
DES	201410	201412
IRA	200610	201408
CMI(C)	201501	201508
LTM	201510	202008

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises 22 acres in the north central portion of the installation. This area was used for storing and recycling ether and alcohol. The Tank Farm which consists of three contiguous areas: South Tank Farm (which includes the 600-2, 600-3, and 600-4 Tanks, and Still Houses 3502 and 4502), the North Tank Farm (which includes the 600-1 Tanks) and the Loading Stations, the Compressor buildings and tanks (Building 1991). The tank farm received and processed recycled solvents which included alcohol and ether. Numerous releases have been documented from within the Tank Farm. Although the tanks were removed, the foundations and saddles remain. This site has not been used for solvent storage and recycling since 1960. The 600-1 Tanks were used for storing diesel fuel starting in the mid-1970's. The east 600-3 Tank was used for storing gasoline starting in the mid-1970's.

This site is located in Parcel 8-2(7)HR(P) shown in the 1998 site-wide EBS.

In the March 2003 RRSE, arsenic and benzo(a)pyrene results in the soil, and arsenic and lead results in groundwater exceeded the USEPA Region IX PRGs.

An RFI work plan was prepared, and is awaiting approval by KDHE.

ICM for contaminated soil underneath explosive foundations is covered in the AOCs 23/24 ICM for SAAP-065.

RFI activities include collecting surface soil samples at locations of potential contamination. Surface drainage soil samples will be collected from the drainage ditches in the vicinity of SWMU 65. Soil samples will be analyzed for RCRA metals, manganese, 2,4-DNT, NC, SVOCs, VOCs, TPH-DRO, and TPH-GRO. Horizontal and vertical delineation of contamination discovered during initial sampling will be performed and involves soil stepout samples and subsurface soil samples. Groundwater grab samples will be collected using DPT soil bore holes. Groundwater samples will be collected from existing monitoring wells. Groundwater monitoring wells will be installed and groundwater samples collected.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were

will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

The ICM (pre-AOC 23) involves collecting soil samples and sending to an offsite laboratory for analysis to horizontally delineate surface area of soil contamination around MEC foundations. One fixed-base laboratory sample will be collected every 30 linear around each MEC foundation. Additional samples are required for foundations that are not in exactly 30 linear feet increments. An estimated failure rate of 15 percent of these samples having contaminants above TMCLs requiring excavation then requires step out samples to horizontally delineate the surface soil contamination. Three surface samples bound each exceedance horizontally (the foundation bounds the fourth side). An estimated failure rate of five percent of the step out samples having contaminants above TMCLs requiring excavation then requires additional step out samples to horizontally delineate the surface soil contamination. Grids with TMCL exceedances will be excavated. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation.

LTM is planned and involves sampling five wells twice a year for five years. Contaminants to analyze for in the groundwater samples are RCRA metals, manganese, 2,4-DNT, SVOCs, and VOCs.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-066
Site Name: Installation-wide Stream Study
Alias: SWMU 66

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: HIGH

Contaminants of Concern: Dioxins/Dibenzofurans, Explosives, Metals, Pesticides, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Sediment, Surface Water

Phases	Start	End
RFA	199808	200303
CS	199808	200303
RFI/CMS	200303	200508
DES	201407	201408
CMI(C)	201408	201508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises 8.6 miles of streams across the installation. This area was used for disposal of wastewater. In February 2000 USEPA ordered SFAAP to conduct stream monitoring. This site is designated for sampling the installation-wide surface waters of Captain Creek (10,861 linear feet), Hanson Creek (6,900 linear feet), Kill Creek (9,097 linear feet), and Spoon Creek (18,506 linear feet).

A RRSE was conducted in July 2005.

In August 2003 an RFI was initiated. Phase I included sediment and surface sampling. Sediment sampling results were compared to the threshold effect concentrations (TECs) provided in the document, Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems (MacDonald et al., 2000). There were 21 sediment samples that exceeded the TECs at 16 sample locations. Surface water sample results were compared to the Acute Aquatic Life Screening Values in the Kansas Surface Water Quality Standards (KSWQS) (KDHE, 2004). There were five surface water samples that exceeded the KSWQS at three sample locations. In July 2005 the RFI was completed. Phase II and Phase III results indicated that arsenic, chromium, cobalt, iron, lead and NG in sediment samples were above the TECs. Surface water sample contaminants above the KSWQS were dieldrin and 4,4-dicholoro-diphenyl-trichloroethane (DDT).

KDHE's comment letter on the RFI report stated: There is significant potential that in-drainage sediment samples [contamination] will be transported by fluvial action into the in-stream areas. Therefore, remediation is required for impacted in-drainage sediments, followed by LTM. Limited "hot-spot" remediation of in-stream sediment may be performed without significant disruption to the stream. LTM is recommended to follow remediation to determine the long term effects.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is not anticipated at this site.

Site ID: SAAP-067
Site Name: South Acid Area
Alias: SWMU 67

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: MEDIUM

Contaminants of Concern: Metals, Nitrate/Nitrite, Petroleum, Oil and Lubricants (POL), Polycyclic Aromatic Hydrocarbons (PAH), Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Sediment, Soil, Surface Water

Phases	Start	End
RFA	199808	200303
CS	199808	200303
RFI/CMS	200303	201408
DES	201410	201412
IRA	200610	201408
CMI(C)	201501	201508
LTM	201510	202508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises 26 acres in the east central portion of the installation. This area was used for production and recycling of nitric acid and sulfuric acid. The South Acid Area was operated from 1943 to 1998. This area contains numerous buildings and tanks (Bldgs 700 and 900 series). The conditions of these buildings range from being intact to total disrepair to having been demolished. Drainage ditches in the area were used for managing spills and wastewater discharges. Areas of discolored soil were noted during inspections in 2001. This area also includes AOC 7 (Building 719-2; Former Truck Maintenance Shop), AOC 8 (Former Fuel Oil Storage Tank), and AOC 9 (Building 554-6; Oil and Paint House).

This site is shown as an area needing investigation in the 1998 site-wide EBS.

In the March 2003 RRSE benzo(a)pyrene, lead and arsenic in surface soils exceeded the USEPA Region IX PRGs.

An RFI work plan was prepared in November 2008, and was approved by KDHE. Fieldwork was started, but was stopped due to insufficient funds.

ICM for contaminated soil underneath explosive foundations is covered in the AOCs 23/24 ICM for SAAP-067.

The ICM (pre-AOC 23) involves collecting soil samples and sending to an off-site laboratory for analysis to horizontally delineate surface area of soil contamination around MEC foundations. One fixed-base laboratory sample will be collected every 30 linear around each MEC foundation. Additional samples are required for foundations that are not in exactly 30 linear feet increments. An estimated failure rate of 15 percent of these samples having contaminants above TMCLs requiring excavation then requires step out samples to horizontally delineate the surface soil contamination. Three surface samples bound each exceedance horizontally (the foundation bounds the fourth side). An estimated failure rate of five percent of the step out samples having contaminants above TMCLs requiring excavation then requires additional step out samples to horizontally delineate the surface soil contamination. Grids with TMCL exceedances will be excavated. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal

as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

LTM is planned and involves sampling eight wells twice a year for ten years. Contaminants to analyze for in the groundwater samples are RCRA metals, hexavalent chromium, manganese, nickel, vanadium, SVOCs, VOCs, TPH-DRO, TPH-GRO, NG, nitrate, sulfate, ammonia, and pH.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-101
Site Name: Monitoring Well West of Old Admin B
Alias: AOC 1

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: MEDIUM

Contaminants of Concern: Metals, Nitrate/Nitrite

Media of Concern: Groundwater

Phases	Start	End
RFA	199808	200303
CS	199808	200303
RFI/CMS	200304	201402
LTM	201403	201808

RIP Date: N/A

RC Date: 201402

SITE DESCRIPTION

This site comprises 32 acres in the northeast portion of the installation. This area was used as green space and barracks for soldiers. Nitrate contamination has been documented in a monitoring well pair (overburden-bedrock nested pair) in this area.

This site is located in Parcel 1-26(7)HR(P) shown in the 1998 site-wide EBS.

In the February 2004 RRSE nitrate results in groundwater exceeded risk level. At that time the source of the nitrates was unknown.

In a letter dated May 7, 2007 KDHE requested an investigation for AOC 1 to determine the nitrate contaminant source area and to delineate the groundwater contaminant plume. An RFI work plan was prepared in November 2009, and was approved by KDHE. Fieldwork was completed. There were no soil (surface and subsurface) exceedances of residential TMCLs at seven sampling locations. There were two groundwater sample exceedances of the industrial TMCL for antimony at two new monitoring wells. The RFI sampling shows that there is no nitrate groundwater plume, and that the source of nitrate in groundwater is localized to the original two monitoring wells (002MW005 & 002MW006). An RFI report will be prepared. Due to nitrate exceedances in groundwater monitoring will continue.

LTM is planned and involves sampling four wells twice a year for five years. Contaminants to analyze for in the groundwater samples are nitrate, nitrate/nitrite, and antimony. The two new wells (A01MW003 and A01MW004) need to be sampled for antimony only.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-102
Site Name: Main Electrical Switch Yard
Alias: AOC 2

STATUS

Parcel: NONE

Regulatory Driver: RCRA
RRSE: LOW

Contaminants of Concern: Dioxins/Dibenzofurans, Polychlorinated Biphenyls (PCB)

Media of Concern: Soil

Phases	Start	End
RFA	199808	200303
CS	199808	200303
RFI/CMS	201310	201408
DES	201410	201412
CMI(C)	201501	201508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises two acres in the central portion of the installation. This area was used to transform electricity coming on plant at 115,000 volts to 12,000 volts and further. AOC 2 measures 360 feet by 185 feet for an area of 66,600 square feet. Based on interviews with a former employee, a transformer fire resulting from a lightning strike occurred around 1945. The majority of the transformers (assumed to contain PCBs based on that time period) were said to have been destroyed by the fire. This site was active until 2003, at which time the transformers were removed.

This site is located in Parcel 1-29(7)HR(P) shown in the 1998 site-wide EBS.

A CERCLA remediation using TSCA as an ARAR was conducted in 2004. The investigation and cleanup was done under TSCA regulations using non-ER,A funds. Therefore this ICM work is not shown in the phase schedule. A total of 5,060 tons of PCB contaminated soil were excavated and disposed of. All remaining soil in SAAP-102 was below unrestricted levels for PCBs (one mg/kg) as reported in the Polychlorinated Biphenyl Sites Cleanup Report by Shaw Environmental (September 2007).

In a letter dated January 29, 2008 KDHE approved with conditions the Polychlorinated Biphenyl Sites Cleanup Report by Shaw Environmental (September 2007).

Additional investigation and cleanup is required to close the data gaps identified in KDHE's letter dated January 29, 2008.

RFI activities involve the following estimated soil samples necessary to close the data gaps identified by KDHE. Surface soil samples will be collected in the entire area of AOC 2. An estimated failure rate of 30 percent of these samples having contaminants above TMCLs requiring excavation then requires step out samples to horizontally delineate the surface soil contamination. Three surface samples bound each exceedance horizontally. An estimated failure rate of 10 percent of the step out samples having contaminants above TMCLs requiring excavation then requires first additional step out samples to horizontally delineate the surface soil contamination. An estimated failure rate of five percent of the first additional step out samples having contaminants above TMCLs requiring excavation then requires second additional step out samples to horizontally delineate the surface soil contamination. Samples will be analyzed for dioxins, PCBs, SVOC-PAHs, and TPH-DRO.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were

will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is not anticipated at this site.

Site ID: SAAP-105
Site Name: Canon Range Tunnels (Facility 303)
Alias: AOC 5

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: LOW

Contaminants of Concern: Explosives, Metals, Polycyclic Aromatic Hydrocarbons (PAH)

Media of Concern: Soil

Phases	Start	End
RFA	199808	200303
CS	199808	200303
RFI/CMS	200801	201408
DES	201410	201412
CMI(C)	201501	201508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises three acres in the eastern portion of the installation. This area was used for test firing 2.75 inch inert rockets. The Army fired 2.75 inch inert rockets into the two tunnels at this site. The greatest potential for surface soil contamination was anticipated to be at the firing pads, along the firing line leading from the firing pads to the tunnels, and within the tunnels.

Results in the the September 1989 RI report indicated that explosives and metals were present in the soil at low levels.

This site is located in Parcel 2-11(7)HR(P) shown in the 1998 site-wide EBS.

In the March 2003 RRSE arsenic was the only compound exceeding the USEPA Region IX PRG value, but was below background level. The RRSE report recommended NFA at this site; however, KDHE wrote a letter recommending the Army conduct additional soil sampling.

An RFI work plan was prepared in January 2008, and was approved by KDHE. Fieldwork is complete. There were 59 soil sample exceedances of industrial TMCLs at 28 sampling locations. There were no groundwater sample exceedances of industrial TMCLs. An RFI report will be prepared.

The ICM involves collecting soil samples and sending to an off-site laboratory for analysis to horizontally delineate surface area of soil contamination around MEC foundations. One fixed-base laboratory sample will be collected every 30 linear around each MEC foundation. Additional samples are required for foundations that are not in exactly 30 linear feet increments. An estimated failure rate of 15 percent of these samples having contaminants above TMCLs requiring excavation then requires step out samples to horizontally delineate the surface soil contamination. Three surface samples bound each exceedance horizontally (the foundation bounds the fourth side). An estimated failure rate of five percent of the step out samples having contaminants above TMCLs requiring excavation then requires additional step out samples to horizontally delineate the surface soil contamination. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

Post excavation confirmation samples one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

Site ID: SAAP-105
Site Name: Canon Range Tunnels (Facility 303)
Alias: AOC 5

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is not anticipated at this site.

Site ID: SAAP-106
Site Name: Process Facilities with F-Line Area
Alias: AOC 6

STATUS

Parcel: NONE

Regulatory Driver: RCRA
RRSE: MEDIUM

Contaminants of Concern: Explosives, Metals, Polychlorinated Biphenyls (PCB), Polycyclic Aromatic Hydrocarbons (PAH)

Media of Concern: Soil

Phases	Start	End
RFA	199808	200303
CS	199808	200303
RFI/CMS	200401	201408

RIP Date: N/A

RC Date: 201408

SITE DESCRIPTION

This site comprises 89 acres in the east central portion of the installation. This area was used to produce 2.75 inch rocket grains. AOC 6 consists of 35 process facilities located in the west area of F-Line. This parcel has been delineated to include the following facilities: D120-7, F120-4, F120-8, 181-3, 563, 5815-1, 5815-2, 5815-3, 5816-2, 5822, 5823, 5837, 5850, 5861, 7803-1, 7803-2, 7803-3, 7803-4, 7814, 7815-1, 7816-1, 7816-2, 7816-3, 7826, 7827, 7828, 7832, 7866, 7868-1, 7868-2, 7868-3, 7868-4, 7871-2, 7897, and 7898. This site was handled under SAAP-010.

This site is located in Parcel 2-18(7)HR(P) shown in the 1998 site-wide EBS.

In the March 2003 RRSE NG and lead were the only compounds exceeding USEPA Region IX PRGs.

Investigation of 10 additional acres in SAAP-010, and all of SAAP-106 was completed in 2004. A total of 4,945 tons of contaminated soil from SAAP-106 and part of SAAP-010 were excavated and disposed of in March 2005. This ICM work was funded under SWMU 10 and therefore is not shown in the phase schedule.

ICM for contaminated soil underneath explosive buildings and sewers in the F-Line (including AOC 6) was covered in the AOCs 23/24 ICM for SAAP-010. A total of 76,964 tons of contaminated soil from underneath explosive foundations and sewers in SAAP-010 and SAAP-106 were excavated and disposed of, and was completed in 2008. This ICM work was funded under AOC 23 and therefore is not shown in the phase schedule. An ICM completion report is being prepared. After KDHE approval of the ICM completion report a SOB for NFA for SAAP-106 will be prepared.

CLEANUP/EXIT STRATEGY

The RFI is expected to demonstrate no risk at the site and allow for an NFA determination.

Site ID: SAAP-107
Site Name: Truck Maintenance Shop, South Acid
Alias: AOC 7

STATUS

Parcel: NONE

Regulatory Driver: RCRA
RRSE: LOW

Contaminants of Concern: Polycyclic Aromatic Hydrocarbons (PAH)

Media of Concern: Soil

Phases	Start	End
RFA	199808	200303
CS	199808	200303
RFI/CMS	200811	201408

RIP Date: N/A

RC Date: 201408

SITE DESCRIPTION

This site comprises one acre in the central portion of the installation. This area was used for maintenance of trucks used in the South Acid Area. A methylene chloride release was detected next to the Former Truck Maintenance Shop (Account 719-2).

This site is located in Parcel 3-4(3)HR shown in the 1998 site-wide EBS. SAAP-107 is being handled under SAAP-067. After cleanup of SAAP-067 is completed a SOB for NFA for SAAP-107 will be prepared.

CLEANUP/EXIT STRATEGY

The RFI is expected to demonstrate no risk at the site and allow for an NFA determination.

Site ID: SAAP-108
Site Name: Fuel Oil Storage Tank, South Acid
Alias: AOC 8

STATUS

Parcel: NONE

Regulatory Driver: RCRA
RRSE: LOW

Contaminants of Concern: Polycyclic Aromatic Hydrocarbons (PAH)

Media of Concern: Soil

Phases	Start	End
RFA	199808	200303
CS	199808	200303
RFI/CMS	200811	201408

RIP Date: N/A

RC Date: 201408

SITE DESCRIPTION

This site comprises one acre in the central portion of the installation. This area was used for storing fuel oil for the sulfuric acid concentrator. A chloroform release was detected next to the Former Fuel Oil Storage Tank (account 733-2).

This site is located in Parcel 3-5(3)HR shown in the 1998 site-wide EBS. SAAP-108 is being handled under SAAP-067. After cleanup of SAAP-067 is completed a SOB for NFA for SAAP-108 will be prepared.

CLEANUP/EXIT STRATEGY

The RFI is expected to demonstrate no risk at the site and allow for an NFA.

Site ID: SAAP-109
Site Name: Oil & Paint House, South Acid
Alias: AOC 9

STATUS

Parcel: NONE

Regulatory Driver: RCRA
RRSE: LOW

Contaminants of Concern: Polycyclic Aromatic Hydrocarbons (PAH)

Media of Concern: Soil

Phases	Start	End
RFA	199808	200303
CS	199808	200303
RFI/CMS	200811	201408

RIP Date: N/A

RC Date: 201408

SITE DESCRIPTION

This site comprises one acre in the central portion of the installation. This area was used for storing oil and paint. A methylene chloride release was detected next to the Oil and Paint House (Account 554-6).

This site is located in Parcel 3-6(3)HR shown in the 1998 site-wide EBS. SAAP-109 is being handled under SAAP-067. After cleanup of SAAP-067 is completed a SOB for NFA for SAAP-109 will be prepared.

CLEANUP/EXIT STRATEGY

The RFI is expected to demonstrate no risk at the site and allow for an NFA determination.

Site ID: SAAP-110
Site Name: Storage Magazines Not in SWMU 15,16
Alias: AOC 10

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: LOW

Contaminants of Concern: Metals

Media of Concern: Groundwater, Soil

Phases	Start	End
RFA	199808	200303
CS	199808	200303
RFI/CMS	200303	201408
LTM	201410	201908

RIP Date: N/A

RC Date: 201408

SITE DESCRIPTION

This site comprises 541 acres in the southern portion of the installation. This area was used to store produced propellants. There are 81 magazines, 32 magazine foundations, and 15 igloos in this area.

It is located in Parcel 4-1(1) shown in the 1998 site-wide EBS.

In the March 2003 RRSE arsenic was the only compound to exceed its respective Region IX PRG value, but was below background level.

An RFI was prepared in October 2008, and was approved by KDHE. Fieldwork was completed. There were no soil samples exceeding industrial TMCLs for all investigations at AOC 10. Exceedances for pesticides in soil were excluded because the Army does not clean up applied pesticides. Groundwater samples exceeded TMCLs for arsenic, dieldrin, and manganese. An RFI report will be prepared. Groundwater monitoring is planned.

LTM is planned and involves installing two additional wells, and then sampling five wells twice a year for five years. Contaminants to analyze for in the groundwater samples are arsenic, dieldrin, manganese.

CLEANUP/EXIT STRATEGY

The RFI is expected to demonstrate no risk at the site and allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-111
Site Name: Forced Air Dryers
Alias: AOC 11

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: LOW

Contaminants of Concern: Metals

Media of Concern: Soil

Phases	Start	End
RFA	199808	200303
CS	199808	200303
RFI/CMS	201009	201408
DES	201410	201412
IRA	200904	201101
CMI(C)	201501	201508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises 278 acres in the west central portion of the installation. This area was used for drying multi-base solvent propellant. SAAP-111 consists of over 50 buildings designated as Forced Air Dryers, Rest Houses, Screen Houses, and Can Pack Houses.

This site is in Parcel 5-10(7)HR shown in the site-wide EBS.

In the March 2003 RRSE arsenic was the only compound to exceed the USEPA Region IX PRG value and local background. The RRSE report recommended NFA at this site; however, KDHE wrote a letter requesting additional soil and groundwater sampling.

ICM for contaminated soil underneath explosive foundations and sewers was covered in the AOCs 23/24 ICM for SAAP-111. The ICM work plan was prepared in September 2009, and was approved by KDHE. Fieldwork was completed. A total of 75,864 tons of contaminated soil was excavated and disposed of under the AOC 23/24 ICM work plan at AOC 11. An ICM completion report for SAAP-111 will be prepared.

An RFI work plan has been prepared, but is awaiting approval by KDHE.

RFI activities include collecting surface soil samples at locations of potential contamination. Surface drainage soil samples will be collected from the drainage ditches in the vicinity of AOC 11. Sediment/surface water sample pairs to be collected and analyzed for RCRA metals, manganese, explosives (including NC, NG, NQ, GN), SVOCs, TPH-DRO, nitrate, ammonia, sulfate, and pesticides. Horizontal and vertical delineation of contamination discovered during initial sampling will be performed and involves soil stepout samples and subsurface soil samples. Groundwater grab samples will be collected using DPT soil bore holes. Groundwater samples will be collected from existing monitoring wells. Groundwater monitoring wells will be installed and groundwater samples collected.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

Site ID: SAAP-111
Site Name: Forced Air Dryers
Alias: AOC 11

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is not anticipated at this site.

Site ID: SAAP-112
Site Name: Paste Air Dry Facilities
Alias: AOC 12

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: LOW

Contaminants of Concern: Metals

Media of Concern: Soil

Phases	Start	End
RFA	199808	200303
CS	199808	200303
RFI/CMS	200303	201408
DES	201410	201412
IRA	200610	201408
CMI(C)	201501	201508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises 36 acres in the central portion of the installation. SAAP-112 consists of 16 buildings that were part of the F-Line and N-Line operations. All of the buildings have been burnt with only foundations remaining.

It is in Parcel 5-13(7)HR(P) shown in the 1998 site-wide EBS.

In the March 2003 RRSE arsenic and lead exceeded the USEPA Region IX PRGs.

An RFI work plan was prepared in March 2011, and is awaiting approval by KDHE.

ICM for contaminated soil underneath explosive foundations and sewers is covered in the AOCs 23/24 ICM for SAAP-112. The work plan for AOCs 23/24 ICM at SAAP-112 was prepared in March 2011, and is awaiting approval by KDHE.

The ICM (pre-AOC 23) involves collecting soil samples and sending to an off-site laboratory for analysis to horizontally delineate surface area of soil contamination around MEC foundations. One fixed-base laboratory sample will be collected every 30 linear around each MEC foundation. Additional samples are required for foundations that are not in exactly 30 linear feet increments. An estimated failure rate of 15 percent of these samples having contaminants above TMCLs requiring excavation then requires step out samples to horizontally delineate the surface soil contamination. Three surface samples bound each exceedance horizontally (the foundation bounds the fourth side). An estimated failure rate of five percent of the step out samples having contaminants above TMCLs requiring excavation then requires additional step out samples to horizontally delineate the surface soil contamination. Grids with TMCL exceedances will be excavated. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation.

RFI activities include collecting surface soil samples and analyzing for RCRA metals, manganese, SVOCs, explosives (including NC, NG, NQ), nitrate, and ammonia. One new monitoring well will be installed and five groundwater samples taken (includes new well plus four existing wells).

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were

will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is not anticipated at this site.

Site ID: SAAP-114
Site Name: Robert's Lake
Alias: AOC 14

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: HIGH

Contaminants of Concern: Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Sediment, Surface Water

Phases	Start	End
RFA	199808	200303
CS	199808	200303
RFI/CMS	200303	201408

RIP Date: N/A

RC Date: 201408

SITE DESCRIPTION

This site comprises one acre in the west central portion of the installation. This area was used as a recreational fishing lake. SAAP-114 is located south of the Old Sanitary Landfill (SWMU 18) and west (downgradient) of G-line (SWMU 17). Roberts Lake current and future use is for recreation. The site is in Parcel 6-7(7)HR(P) shown in the 1998 site-wide EBS.

In 1994 a Receiving Waters Biological Study was conducted, and sampled for SVOCs, metals and explosives. Arsenic and Lead were the only compounds in surface water to exceed USEPA Region IX PRGs. Arsenic in sediment exceeded USEPA Region IX PRGs.

In the March 2003 RRSE the 1994 data were used to run the RRSE calculations. The RRSE recommended further action at this site due to recreational use (fishing) with the risk exceeded for arsenic and lead in surface water.

An RFI work plan was prepared in March 2009, and was approved by KDHE. Fieldwork was started, but was stopped due to insufficient funds.

No corrective measures are planned for AOC 14 because sediment and surface water samples of Roberts Lake did not exceed recreational TMCLs, and groundwater samples did not exceed residential TMCLs.

CLEANUP/EXIT STRATEGY

The RFI is expected to demonstrate no risk at the site and allow for an NFA determination.

Site ID: SAAP-115
Site Name: Hazard Analysis Testing Lab
Alias: AOC 15

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: MEDIUM

Contaminants of Concern: Metals

Media of Concern: Soil

Phases	Start	End
RFA	199808	200303
CS	199808	200303
RFI/CMS	200303	201408
DES	201410	201412
CMI(C)	201501	201508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises one acre in the north central portion of the installation. This area was used as an indoor firing range, and for ballistics testing of explosives and propellant. This area consists of Building 300 which includes an indoor firing range which used sand to catch expended small-caliber test projectiles. Some of the sand was disposed in piles just outside a door on the south side of the building and a door on the north side of the building. Both sand piles measure 60 feet by 30 feet.

This site is in Parcel 7-2(5)HR shown in the 1998 site-wide EBS.

In the March 2003 RRSE lead and arsenic in the soil were the only contaminants to exceed Region IX PRGs.

An RFI work plan was prepared in March 2009, and was approved by KDHE. Fieldwork is complete. There were four soil sample exceedances of the industrial TMCL for lead at three sampling locations. There were no groundwater sample exceedances of industrial TMCLs.

An RFI report was prepared in March 2011, and is awaiting approval by KDHE.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is not anticipated at this site.

Site ID: SAAP-116
Site Name: Nitrocellulose Production Lines
Alias: AOC 16

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: MEDIUM

Contaminants of Concern: Explosives, Metals, Polychlorinated Biphenyls (PCB)

Media of Concern: Soil

Phases	Start	End
RFA	199808	200303
CS	199808	200303
RFI/CMS	200303	201408
DES	201410	201412
IRA	200610	201408
CMI(C)	201501	201508
LTM	201510	202008

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises 107 acres in the north central portion of the installation. This area was used to produce NC. Each of the four production lines is approximately 10 acres in size and contains 10 or more buildings. The majority of the buildings have been burned and all that remains are the concrete foundations and underground explosive sewers. The NC Production Lines produced NC during the periods of 1943-1960, and 1965-1971. Cotton fibers and wood pulp were nitrated using a mixture of nitric acid and sulfuric acid. Nitric acid and sulfuric acid was produced and recycled in the North and South Acid Areas. NC and other hazardous constituents were released to the soil and potentially the groundwater in the proximity of the production facilities.

This site is in segment 8 shown in the 1998 site-wide EBS.

In the March 2003 RRSE arsenic and lead were above their respective TMCLs, and SVOCs were detected in the soil above the USEPA Region IX PRGs.

An RFI work plan prepared in November 2008, and was approved by KDHE. Fieldwork was started, but was stopped due to insufficient funds.

ICM for contaminated soil underneath explosive foundations and sewers is covered in the AOCs 23/24 ICM for SAAP-116. The ICM work plan was prepared in September 2009, and was approved by KDHE. Fieldwork was started, but was stopped due to insufficient funds.

To complete the AOCs 23/24 ICM the data from the previous rind soil sampling under the AOC 23 ICM work plan were used to determine the number of exceedances of industrial TMCLs. Grids containing TMCL exceedances will be excavated. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation.

RFI field investigation sampling involves taking surface soil samples in areas around the laboratories and support buildings in the Laboratory Support Area, the Solvent Storage Area, historic aboveground storage tank (AST) and UST locations, adjacent and downgradient to the Rail Unloading Station (Account 113-19), at historic spill locations, within the Corporation Yard (Account 558-1), and at potential release points around the Sunflower Environmental Group Incorporated fluorescent light recycling facility (Account 1885-4). Additional soil samples will be collected from areas of contamination discovered during initial sampling such as leaks from former overhead piping and areas of soil discoloration. Surface drainage soil samples will be collected from drainage ditches draining from contaminated areas. Horizontal and vertical delineation of contamination discovered during initial sampling will be performed and involves soil stepout samples and subsurface soil samples. Groundwater grab samples will be collected using DPT soil bore holes. Groundwater samples will be collected from existing monitoring wells. Groundwater monitoring wells

will be installed and groundwater samples collected.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

LTM is planned and involves sampling six wells twice a year for five years. Contaminants to analyze for in the groundwater samples are RCRA metals, nitrate/nitrite, and sulfate.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-117
Site Name: Nitroguanidine Production Buildings
Alias: AOC 17

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: LOW

Contaminants of Concern: Explosives, Metals

Media of Concern: Soil

Phases	Start	End
RFA	199808	200303
CS	199808	200303
RFI/CMS	201005	201408
DES	201410	201412
IRA	200610	201408
CMI(C)	201501	201508
LTM	201510	202508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises 139 acres in the north west portion of the installation. This area was used for producing NQ. SAAP-117 includes all buildings which have been identified as being potentially contaminated with explosives located in the NQ Production Area. NQ is a major constituent of multibase propellants. The NQ production process starts with the conversion of calcium carbide to calcium cyanamide. Purchased calcium carbide is ground and mixed in a ball mill with calcium fluoride. This material is aspirated into a rotary kiln where, under a blanket of nitrogen gas, the conversion to calcium cyanamide takes place. The calcium cyanamide is converted into GN by reacting the calcium cyanamide with ammonium nitrate, nitric acid, and anhydrous ammonia. GN is converted to NQ by reacting the GN with oleum and nitric acid. Crystallization of NQ followed by drying and packaging complete the process.

This site is in Parcel 9-5(6)HR shown in the 1998 site-wide EBS. Based on a review of the documents, visual inspections and interviews, there is evidence that NQ and GN contamination was observed leaching out of walls and floors during the 1998 EBS visual inspection.

In the March 2003 RRSE the site was sampled for NQ and nitrates/nitrites with no detections above USEPA Region IX PRG values. The RRSE report recommended NFA at this site; however, KDHE wrote a letter requesting the Army conduct additional soil sampling.

An RFI work plan was prepared in May 2010, and is awaiting approval by KDHE.

ICM for contaminated soil underneath explosive foundations and sewers is covered in the AOCs 23/24 ICM for SAAP-117.

RFI activities include collecting surface soil samples at locations of potential contamination. Surface drainage soil samples will be collected from the drainage ditches in the vicinity of AOC 17. Sediment/surface water sample pairs to be collected and analyzed for RCRA metals, hexavalent chromium, cobalt, iron, manganese, SVOCs, VOCs, NQ, GN, ethylene glycol, PCBs, TPH-DRO, nitrate, sulfate, ammonia, cyanide, fluoride, and pH. Horizontal and vertical delineation of contamination discovered during initial sampling will be performed and involves soil stepout samples and subsurface soil samples. Groundwater grab samples will be collected using DPT soil bore holes. Groundwater samples will be collected from existing monitoring wells. Groundwater monitoring wells will be installed and groundwater samples collected.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

Site ID: SAAP-117
Site Name: Nitroguanidine Production Buildings
Alias: AOC 17

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

The ICM (pre-AOC 23) involves collecting soil samples and sending to an off-site laboratory for analysis to horizontally delineate surface area of soil contamination around MEC foundations. One fixed-base laboratory sample will be collected every 30 linear around each MEC foundation. Additional samples are required for foundations that are not in exactly 30 linear feet increments. An estimated failure rate of 15 percent of these samples having contaminants above TMCLs requiring excavation then requires step out samples to horizontally delineate the surface soil contamination. Three surface samples bound each exceedance horizontally (the foundation bounds the fourth side). An estimated failure rate of five percent of the step out samples having contaminants above TMCLs requiring excavation then requires additional step out samples to horizontally delineate the surface soil contamination. Grids with TMCL exceedances will be excavated. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation.

LTM is planned and involves sampling ten wells twice a year for ten years. Contaminants to analyze for in the groundwater samples are RCRA metals, manganese, GN, NQ, VOCs, perchlorate (only at lab), nitrate, sulfate, ammonia.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

Site ID: SAAP-118
Site Name: Trench Disposal Area A3
Alias: AOC 18

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: HIGH

Contaminants of Concern: Metals, Polycyclic Aromatic Hydrocarbons (PAH), Volatiles (VOC)

Media of Concern: Sediment, Soil

Phases	Start	End
RFA	199808	200303
CS	199808	200303
RFI/CMS	200711	201408
DES	201410	201412
CMI(C)	201501	201508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises 34 acres in the northeast portion of the installation. This area was used for staging building material during construction of SFAAP. This site was identified by USEPA in 1994 as A3 in a 1948 aerial photograph from disturbed ground west of SAAP-001.

In the July 2005 RRSE lead was detected above the industrial risk level.

An RFI work plan was prepared in November 2007, and was approved by KDHE. Fieldwork is complete. There was one soil sample that exceeded the industrial TMCL for lead. The groundwater samples did not exceed residential TMCLs at SAAP-118. An RFI report was prepared, and is awaiting approval by KDHE.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is not anticipated at this site.

Site ID: SAAP-119
Site Name: Trench Disposal Area A4
Alias: AOC 19

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: LOW

Contaminants of Concern: Metals

Media of Concern: Soil

Phases	Start	End
RFA	199808	200303
CS	199808	200508
RFI/CMS	200711	201408

RIP Date: N/A

RC Date: 201408

SITE DESCRIPTION

This site comprises one acre in the northeast portion of the installation. This area was used as a borrow source for building the railroad during construction of SFAAP. This site was identified by USEPA in 1994 as A4 in a 1948 aerial photograph from disturbed ground south west of SAAP-001.

In the July 2005 RRSE there were no contaminants detected above regulatory limits. The RRSE report recommended NFA; however, KDHE wrote letter requesting additional soil and groundwater samples, and conduct trenching with backhoe to verify that no disposal of waste occurred in historic trenches.

An RFI work plan was prepared in November 2007, and was approved by KDHE. Fieldwork is complete. Trenching was conducted for 250 feet and no evidence of disposal activities was found. There were no soil or groundwater samples that exceeded residential TMCLs at SAAP-119. An RFI report was prepared, and is awaiting approval by KDHE.

CLEANUP/EXIT STRATEGY

The RFI is expected to demonstrate no risk at the site and allow for an NFA determination.

Site ID: SAAP-120
Site Name: Trench Disposal Area A5
Alias: AOC 20

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: LOW

Contaminants of Concern: Metals

Media of Concern: Soil

Phases	Start	End
RFA	199808	200303
CS	199808	200508
RFI/CMS	200711	201408
DES	201410	201412
CMI(C)	201501	201508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises one acre in the northeast portion of the installation. This area was a farmstead prior to construction of SFAAP. This site was identified by USEPA in 1994 as A5 in a 1948 aerial photograph from disturbed ground east of SAAP-001.

In the July 2005 RRSE there were no contaminants detected above regulatory limits. The RRSE report recommended NFA; however, KDHE wrote a letter requesting additional soil and groundwater samples, and conduct trenching with backhoe to verify that no disposal of waste occurred in historic trenches.

An RFI work plan was prepared in November 2007, and was approved by KDHE. Fieldwork is complete. Trenching was conducted for 857 feet and no evidence of disposal activities was found. There were four soil samples at three sample locations that exceeded industrial TMCLs. The groundwater samples did not exceed residential TMCLs at SAAP-120. An RFI report was prepared, and is awaiting approval by KDHE.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is not anticipated at this site.

Site ID: SAAP-121
Site Name: Trench Disposal Area A6
Alias: AOC 21

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: LOW

Contaminants of Concern: Metals

Media of Concern: Soil

Phases	Start	End
RFA	199808	200303
CS	199808	200508
RFI/CMS	200711	201408

RIP Date: N/A

RC Date: 201408

SITE DESCRIPTION

This site comprises one acre in the north east portion of the installation. This area was used as a borrow source for building the railroad during construction of SFAAP. This site was identified by USEPA in 1994 as A6 in a 1948 aerial photograph from disturbed ground south of SAAP-001.

In the July 2005 RRSE there were no contaminants detected above regulatory limits. The RRSE report recommended NFA; however, KDHE wrote a letter requesting additional soil and groundwater samples, and conduct trenching with backhoe to verify that no disposal of waste occurred in historic trenches.

An RFI work plan was prepared in November 2007, and was approved by KDHE. Fieldwork is complete. Trenching was conducted for 416 feet and no evidence of disposal activities was found. There were no soil or groundwater samples that exceeded residential TMCLs at SAAP-119. An RFI report was prepared, and is awaiting approval by KDHE.

CLEANUP/EXIT STRATEGY

The RFI is expected to demonstrate no risk at the site and allow for an NFA determination.

Site ID: SAAP-122
Site Name: Old Reclamation Yard
Alias: AOC 22

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: HIGH

Contaminants of Concern: Metals, Polycyclic Aromatic Hydrocarbons (PAH)

Media of Concern: Soil

Phases	Start	End
RFA	199808	200303
CS	199808	200303
RFI/CMS	200303	201408
DES	201410	201412
CMI(C)	201501	201508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises 13 acres in the northeast portion of the installation. This area was used to stage scrap materials. This site was identified by USEPA in 1994 as A8 in a 1948 aerial photograph from disturbed ground in a fenced area south of SAAP-001. A site walk was conducted in February 2003. The following was observed: metal debris, stressed vegetation and bare spots.

In the July 2005 RRSE six compounds exceeded their respective Region IX PRG values, including PCBs, SVOCs and metals.

An RFI work plan was prepared in June 2008, and was approved by KDHE. Fieldwork is complete. There were 19 soil sample exceedances of industrial TMCLs at 13 sampling locations. There were no subsurface soil sample exceedances of industrial TMCLs. Groundwater was not found at AOC 22. An RFI report was prepared, and is awaiting approval by KDHE.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is not anticipated at this site.

Site ID: SAAP-123
Site Name: Cleanup Under Explosive Foundations
Alias: AOC 23

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: MEDIUM

Contaminants of Concern: Explosives, Metals, Munitions and explosives of concern (MEC), Munitions constituents (MC), Nitrate/Nitrite, Pesticides, Polychlorinated Biphenyls (PCB), Polycyclic Aromatic Hydrocarbons (PAH), Semi-volatiles (SVOC)

Media of Concern: Soil

Phases	Start	End
RFA	199505	199808
CS	199809	199810
RFI/CMS	200508	201908
IRA	200610	201908

RIP Date: N/A

RC Date: 201908

SITE DESCRIPTION

This site does not comprise any defined acres in the installation, but instead lies within the boundaries of several SMWUs and AOCs. This area was used to produce explosives and propellant. Site SAAP-123 involves the investigation and cleanup underneath explosive buildings' foundation slabs. This site includes explosive foundations within the following: SAAP-008, 013, 014, 017, 024, 026, 031, 043, 046, 047, 048, 059, 065, 067, 112, 116, and 117. The explosive foundation slabs will be removed and any soil containing greater than 10 percent explosives will be decontaminated per the Department of Defense (DoD) Explosive Safety Board approved Explosive Safety Submission using non-ER,A funds. After explosive decontamination is completed, ER,A funds will pay for investigation and cleanup of contaminated soil underneath the explosive foundation slabs. The soil immediately surrounding the explosive foundations, which is locally called "rind soil", is investigated and cleaned up under each SWMU/AOC in which each explosive foundation exists.

Investigatory sampling cannot be done until the explosive foundation slabs are removed. The soil under the slab must be sampled and excavated immediately after the slab is removed to prevent migration of contamination. Therefore there is no funding under the RFI/CMS phase schedule because the characterization sampling is done during the ICM.

The ICM field work was completed for AOCs 23/24 at F-Line (SWMU 10 & AOC 6), and N-Line (SWMU 36), and Forced Air Dryers (AOC 11). A total of 74,375, 37,676, and 44,791 tons, respectively, of contaminated soil was excavated and disposed of. The ICM completion reports for these sites is being prepared.

The ICM for AOC 23 involves collecting soil samples and sending them to an off-site laboratory for analysis to determine the surface area of soil contamination underneath explosive foundation slabs. There is a total of 1,211,798 square feet of subfoundation slab area in AOC 23 at the sites listed in the preceding paragraph. Ten percent contingency is added for explosive foundations that are larger than indicated on as-built drawings, and finding additional MEC foundations through disassemble and inspection or other fieldwork. This brings the total subfoundation slab area in AOC 23, including 10 percent contingency, at 1,332,978 square feet. One fixed-base laboratory sample will be collected every 900 square feet. Additional samples are required for foundations that are not in exactly 900 square foot increments. An estimated TMCL exceedance rate of 15 percent of the initial samples will require excavation of contaminated soil at the applicable grids. An estimated failure rate of 25 percent of the post excavation confirmation samples of excavation grids will require re-remediation.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

Site ID: SAAP-123
Site Name: Cleanup Under Explosive Foundations
Alias: AOC 23

ACM in the soil surrounding FR1 foundations was caused by open burning explosive buildings with asbestos in place. The current model shows that an average depth of one foot and an average width of eight feet (from the edge of the foundation out to eight feet) could possibly contain ACM burn debris. The length of the ACM debris excavation is 112,766 linear feet of rind soil around FR1 foundations. This excavation would result in excavation of 33,412 bank cubic yards (bcy) of ACM burn debris. There are also some foundations where ACM burn debris was possibly disposed in foundation basements, creating an estimated volume of 290 bcy. Therefore the total volume of ACM burn debris cause by open burning buildings with asbestos in place is estimated at 33,702 bcy, which will be disposed as asbestos contaminated waste.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is not anticipated at this site.

Site ID: SAAP-124
Site Name: Cleanup Under Explosive Sewers
Alias: AOC 24

STATUS

Parcel: All (9065 acres)

Regulatory Driver: RCRA
RRSE: MEDIUM

Contaminants of Concern: Explosives, Metals, Munitions and explosives of concern (MEC), Munitions constituents (MC), Nitrate/Nitrite

Media of Concern: Soil

Phases	Start	End
RFA	199505	199808
CS	199809	199810
RFI/CMS	200508	201908
IRA	200610	201908

RIP Date: N/A

RC Date: 201908

SITE DESCRIPTION

This site does not comprise any defined acres in the installation, but instead lies within the boundaries of several SMWUs and AOCs. This area was used to produce explosives and propellant. SAAP-124 involves the investigation and cleanup underneath explosive sewer lines. This site includes explosive sewer lines within SAAP-008, 014, 017, 024, 026, 065, 067, 116, and 117. The explosive sewer lines will be removed and any soil where the sewer pipe was removed which contains greater than 10 percent explosives will be decontaminated using non-ER,A funds. After explosive decontamination is completed, ER,A funds will pay for investigation and cleanup of any potentially contaminated soil. Some pesticide containing soil (from pesticides applied at wooden buildings) will need to be excavated to expose explosive sewers that must be removed per the Explosive Safety Submission approved by the DoD Explosive Safety Board.

Investigatory sampling cannot be done until the explosive sewers are removed. The soil under the sewer must be sampled and excavated immediately after the sewer is removed to prevent migration of contamination. Therefore there is no funding under the RFI/CMS phase schedule because the characterization sampling is done during the ICM.

The ICM fieldwork was completed for AOCs 23/24 at F-Line (SWMU 10 & AOC 6), and N-Line (SWMU 36). A total of 2,589 tons and 4,952 tons, respectively, of contaminated soil was excavated and disposed of. The ICM completion reports for these sites is being prepared.

The ICM involves collecting soil samples and sending them to an off-site laboratory for analysis to determine the surface area of soil contamination underneath removed explosive sewer pipe. There is an estimated total length of 177,030 linear feet of explosive sewer lines outside explosive foundations. There is an estimated total length of 16,169 linear feet of explosive sewer lines inside explosive foundations. Ten percent contingency is added for explosive sewer pipe found during MEC sewer pipe removal that were not found on as-built drawings, and finding additional MEC sewers through disassemble and inspection of non-MEC pipe connections to MEC sewers. This brings the total explosive sewer trench length in AOC 24, including 10% contingency, to 212,519 linear feet. One five-point composite fixed-base laboratory sample will be collected every 500 linear feet. An estimated TMCL exceedance rate of 15 percent of the initial samples will require excavation of contaminated soil at those contaminated areas. An estimated failure rate of 25 percent of the post excavation confirmation samples in the initial excavation grids will require re-remediation.

Some pesticide containing soil (from pesticides applied at wooden buildings) will need to be excavated to expose explosive sewers inside explosive foundations that must be removed per the Explosive Safety Submission approved by the DoD Explosive Safety Board. Some pesticide containing soil (from pesticides applied at wooden buildings) will need to be excavated to expose explosive sewers exiting foundations containing applied pesticides. Proper disposal of this soil is required.

The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were will be

sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is not anticipated at this site.

IRP Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
PBC Sunflower	Site Wide GFPR	200801	
SAAP-001	Classification Yard	200803	
SAAP-023	New Explosive Waste Burning Ground	199909	
SAAP-028	Waste Calcium Carbide Treatment	198004	
SAAP-029	Industrial Wastewater Lagoons	198004	
SAAP-049	Road Southeast Of Sanitary Landfill	200804	
SAAP-056	Well South of Facility 211	201108	
SAAP-060	Old Photographic Laboratory	201008	
SAAP-104	Disposal Area Southeast of STP	200804	

IRP Schedule

Date of IRP Inception: 197907

Past Phase Completion Milestones

1980	
CS	(SAAP-028 - Waste Calcium Carbide Treatment, SAAP-029 - Industrial Wastewater Lagoons)
RFA	(SAAP-028 - Waste Calcium Carbide Treatment, SAAP-029 - Industrial Wastewater Lagoons)
1990	
RFA	(SAAP-002 - River Water Treatment Plant Lagoons, SAAP-003 - Sewage Treatment Plant Drying Beds, SAAP-004 - Pond A and Sludge Disposal Area, SAAP-005 - Acid Sewage Disposal Plant, SAAP-006 - Pond B and Sludge Disposal Area, SAAP-008 - N. Acid Area - Chromate Conc. Pond, SAAP-009 - N. Acid Area - WW Treatment Lagoon, SAAP-010 - F-Line Area Ditches, SAAP-011 - F-Line Area Settling Ponds, SAAP-012 - Pyotts Pond & Sludge Disposal Area, SAAP-013 - South Acid Area LWTP Evap. Lagoons, SAAP-014 - Rocket Static Test Area, SAAP-015 - Waste Storage Magazines, SAAP-016 - Temporary Waste Storage Magazines, SAAP-017 - G-Line Area Ditches, SAAP-018 - Old/New Sanitary Landfill, SAAP-019 - Ash Landfills, SAAP-020 - Ash Lagoons, SAAP-021 - Contaminated Materials Burn Ground, SAAP-022 - Old Explosive Waste Burning Ground, SAAP-023 - New Explosive Waste Burning Ground, SAAP-024 - Nitroglycerine and Paste Mix Areas, SAAP-025 - Nitrocellulose Area Ditches, SAAP-026 - Single Base Propellant Area Sumps, SAAP-027 - NQ Area SAC & LWTP Evap. Lagoons, SAAP-030 - Pesticide Handling Area, SAAP-031 - Contaminated Waste Processor, SAAP-032 - Lead Decon. and Recovery Unit, SAAP-033 - Paste Area Half Tanks & Ditches, SAAP-034 - Five Corners Settling Ponds, SAAP-035 - Nitroglycerine Area Settling Ponds, SAAP-036 - N-Line Area, SAAP-037 - Sandblast Areas, SAAP-038 - Oil Water Separator, SAAP-039 - South Acid Area Ditches, SAAP-040 - Calcium Cyanimide Disposal Area, SAAP-041 - Calcium Carbonate Cake Landfill, SAAP-042 - Temporary Sanitary Landfill, SAAP-043 - Tunnel Dryers (CCC Storage), SAAP-044 - Tank T784, SAAP-045 - Bldg 9040 & Ca. Cyanamide Conveyor, SAAP-047 - Nitroguanidine Area (25) Sumps, SAAP-048 - Nitroguanidine Support Area, SAAP-049 - Road Southeast Of Sanitary Landfill, SAAP-050 - Disposal Site East of SWMU 1, SAAP-051 - New Reclamation Yard)
1992	
RFA	(SAAP-007 - North Acid Area - Chromate Area, SAAP-046 - Decontamination Oven, SAAP-052 - Paint Bay Building 542)
1994	
RFA	(SAAP-001 - Classification Yard)
1996	
RFA	(SAAP-054 - Fluorescent Tube Wells, SAAP-053 - Burn and Debris Area North of STP)
CS	(SAAP-019 - Ash Landfills)
1997	
CS	(SAAP-027 - NQ Area SAC & LWTP Evap. Lagoons)
1998	
RFI/CMS	(SAAP-041 - Calcium Carbonate Cake Landfill)

1998

CS	(SAAP-001 - Classification Yard, SAAP-002 - River Water Treatment Plant Lagoons, SAAP-003 - Sewage Treatment Plant Drying Beds, SAAP-004 - Pond A and Sludge Disposal Area, SAAP-005 - Acid Sewage Disposal Plant, SAAP-006 - Pond B and Sludge Disposal Area, SAAP-007 - North Acid Area - Chromate Area, SAAP-008 - N. Acid Area - Chromate Conc. Pond, SAAP-009 - N. Acid Area - WW Treatment Lagoon, SAAP-010 - F-Line Area Ditches, SAAP-011 - F-Line Area Settling Ponds, SAAP-012 - Pyotts Pond & Sludge Disposal Area, SAAP-014 - Rocket Static Test Area, SAAP-015 - Waste Storage Magazines, SAAP-016 - Temporary Waste Storage Magazines, SAAP-017 - G-Line Area Ditches, SAAP-018 - Old/New Sanitary Landfill, SAAP-020 - Ash Lagoons, SAAP-021 - Contaminated Materials Burn Ground, SAAP-022 - Old Explosive Waste Burning Ground, SAAP-023 - New Explosive Waste Burning Ground, SAAP-024 - Nitroglycerine and Paste Mix Areas, SAAP-025 - Nitrocellulose Area Ditches, SAAP-026 - Single Base Propellant Area Sumps, SAAP-030 - Pesticide Handling Area, SAAP-031 - Contaminated Waste Processor, SAAP-032 - Lead Decon. and Recovery Unit, SAAP-033 - Paste Area Half Tanks & Ditches, SAAP-034 - Five Corners Settling Ponds, SAAP-035 - Nitroglycerine Area Settling Ponds, SAAP-036 - N-Line Area, SAAP-037 - Sandblast Areas, SAAP-038 - Oil Water Separator, SAAP-039 - South Acid Area Ditches, SAAP-040 - Calcium Cyanimide Disposal Area, SAAP-041 - Calcium Carbonate Cake Landfill, SAAP-042 - Temporary Sanitary Landfill, SAAP-043 - Tunnel Dryers (CCC Storage), SAAP-044 - Tank T784, SAAP-045 - Bldg 9040 & Ca. Cyanamide Conveyor, SAAP-046 - Decontamination Oven, SAAP-047 - Nitroguanidine Area (25) Sumps, SAAP-048 - Nitroguanidine Support Area, SAAP-049 - Road Southeast Of Sanitary Landfill, SAAP-050 - Disposal Site East of SWMU 1, SAAP-051 - New Reclamation Yard, SAAP-052 - Paint Bay Building 542)
RFA	(SAAP-123 - Cleanup Under Explosive Foundations, SAAP-124 - Cleanup Under Explosive Sewers)

1999

RFI/CMS	(SAAP-011 - F-Line Area Settling Ponds, SAAP-027 - NQ Area SAC & LWTP Evap. Lagoons)
IRA	(SAAP-027 - NQ Area SAC & LWTP Evap. Lagoons, SAAP-050 - Disposal Site East of SWMU 1)
CS	(SAAP-123 - Cleanup Under Explosive Foundations, SAAP-124 - Cleanup Under Explosive Sewers, SAAP-053 - Burn and Debris Area North of STP, SAAP-054 - Fluorescent Tube Wells)
CMI(C)	(SAAP-041 - Calcium Carbonate Cake Landfill)
DES	(SAAP-011 - F-Line Area Settling Ponds, SAAP-041 - Calcium Carbonate Cake Landfill)

2000

RFI/CMS	(SAAP-022 - Old Explosive Waste Burning Ground)

2001

IRA	(SAAP-010 - F-Line Area Ditches)
CMI(C)	(SAAP-011 - F-Line Area Settling Ponds)
RFI/CMS	(SAAP-042 - Temporary Sanitary Landfill, SAAP-050 - Disposal Site East of SWMU 1)

2003

2003	
CS	(SAAP-104 - Disposal Area Southeast of STP, SAAP-105 - Canon Range Tunnels (Facility 303), SAAP-106 - Process Facilities with F-Line Area, SAAP-107 - Truck Maintenance Shop, South Acid, SAAP-108 - Fuel Oil Storage Tank, South Acid, SAAP-109 - Oil & Paint House, South Acid, SAAP-110 - Storage Magazines Not in SWMU 15,16, SAAP-111 - Forced Air Dryers, SAAP-112 - Paste Air Dry Facilities, SAAP-114 - Robert's Lake, SAAP-115 - Hazard Analysis Testing Lab, SAAP-116 - Nitrocellulose Production Lines, SAAP-117 - Nitroguanidine Production Buildings, SAAP-118 - Trench Disposal Area A3, SAAP-122 - Old Reclamation Yard, SAAP-056 - Well South of Facility 211, SAAP-057 - Chemical Preparation House, SAAP-058 - Combined Shops Area, SAAP-059 - Laundry Facility, SAAP-060 - Old Photographic Laboratory, SAAP-062 - Transformer Storage Warehouse 566-5, SAAP-063 - Water Towers, SAAP-064 - Paper Burning Ground, SAAP-065 - Tank Farm, SAAP-066 - Installation-wide Stream Study, SAAP-067 - South Acid Area, SAAP-101 - Monitoring Well West of Old Admin B, SAAP-102 - Main Electrical Switch Yard)
RFA	(SAAP-105 - Canon Range Tunnels (Facility 303), SAAP-106 - Process Facilities with F-Line Area, SAAP-107 - Truck Maintenance Shop, South Acid, SAAP-108 - Fuel Oil Storage Tank, South Acid, SAAP-109 - Oil & Paint House, South Acid, SAAP-110 - Storage Magazines Not in SWMU 15,16, SAAP-111 - Forced Air Dryers, SAAP-112 - Paste Air Dry Facilities, SAAP-114 - Robert's Lake, SAAP-115 - Hazard Analysis Testing Lab, SAAP-116 - Nitrocellulose Production Lines, SAAP-117 - Nitroguanidine Production Buildings, SAAP-118 - Trench Disposal Area A3, SAAP-119 - Trench Disposal Area A4, SAAP-120 - Trench Disposal Area A5, SAAP-121 - Trench Disposal Area A6, SAAP-122 - Old Reclamation Yard, SAAP-056 - Well South of Facility 211, SAAP-057 - Chemical Preparation House, SAAP-058 - Combined Shops Area, SAAP-059 - Laundry Facility, SAAP-060 - Old Photographic Laboratory, SAAP-062 - Transformer Storage Warehouse 566-5, SAAP-063 - Water Towers, SAAP-064 - Paper Burning Ground, SAAP-065 - Tank Farm, SAAP-066 - Installation-wide Stream Study, SAAP-067 - South Acid Area, SAAP-101 - Monitoring Well West of Old Admin B, SAAP-102 - Main Electrical Switch Yard, SAAP-104 - Disposal Area Southeast of STP)
IRA	(SAAP-018 - Old/New Sanitary Landfill, SAAP-033 - Paste Area Half Tanks & Ditches, SAAP-035 - Nitroglycerine Area Settling Ponds)
RFI/CMS	(SAAP-033 - Paste Area Half Tanks & Ditches, SAAP-035 - Nitroglycerine Area Settling Ponds)
2004	
IRA	(SAAP-032 - Lead Decon. and Recovery Unit)
RFI/CMS	(SAAP-038 - Oil Water Separator)
DES	(SAAP-022 - Old Explosive Waste Burning Ground)
2005	
RFA	(PBC Sunflower - Site Wide GFPR)
DES	(SAAP-010 - F-Line Area Ditches)
RFI/CMS	(SAAP-010 - F-Line Area Ditches, SAAP-021 - Contaminated Materials Burn Ground, SAAP-025 - Nitrocellulose Area Ditches, SAAP-066 - Installation-wide Stream Study)
CS	(SAAP-119 - Trench Disposal Area A4, SAAP-120 - Trench Disposal Area A5, SAAP-121 - Trench Disposal Area A6)
2006	
RFI/CMS	(SAAP-018 - Old/New Sanitary Landfill)
DES	(SAAP-021 - Contaminated Materials Burn Ground)
2007	
DES	(PBC Sunflower - Site Wide GFPR)
2008	
CMI(C)	(PBC Sunflower - Site Wide GFPR)

IRP Schedule

2008	
IRA	(SAAP-001 - Classification Yard)
RFI/CMS	(SAAP-001 - Classification Yard, SAAP-049 - Road Southeast Of Sanitary Landfill, SAAP-104 - Disposal Area Southeast of STP)
2009	
IRA	(SAAP-030 - Pesticide Handling Area)
2010	
RFI/CMS	(SAAP-060 - Old Photographic Laboratory)
2011	
RFI/CMS	(SAAP-002 - River Water Treatment Plant Lagoons)
IRA	(SAAP-111 - Forced Air Dryers, SAAP-036 - N-Line Area)
LTM	(SAAP-056 - Well South of Facility 211)

Projected Phase Completion Milestones

See attached schedule

Projected Record of Decision (ROD)/Decision Document (DD) Approval Dates

Site ID	Site Name	ROD/DD Title	ROD/DD Date

Final RA(C) Completion Date: 201608

Schedule for Next Five-Year Review: 2016

Estimated Completion Date of IRP at Installation (including LTM phase): 204608

SUNFLOWER ARMY AMMUNITION PLANT IRP Schedule

= phase underway

SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-002	River Water Treatment Plant Lagoons	DES						
		CMI(C)						
		LTM						
SAAP-003	Sewage Treatment Plant Drying Beds	RFI/CMS						
		CMI(C)						
SAAP-004	Pond A and Sludge Disposal Area	RFI/CMS						
		DES						
		CMI(C)						
		LTM						
SAAP-005	Acid Sewage Disposal Plant	RFI/CMS						
		DES						
		CMI(C)						
		LTM						
SAAP-006	Pond B and Sludge Disposal Area	RFI/CMS						
		DES						
		CMI(C)						
		LTM						
SAAP-007	North Acid Area - Chromate Area	RFI/CMS						
		DES						
		CMI(C)						
		LTM						
SAAP-008	N. Acid Area - Chromate Conc. Pond	RFI/CMS						
		IRA						
SAAP-009	N. Acid Area - WW Treatment Lagoon	RFI/CMS						
		DES						
		CMI(C)						
		LTM						
SAAP-010	F-Line Area Ditches	CMI(C)						
		LTM						
SAAP-011	F-Line Area Settling Ponds	LTM						

SUNFLOWER ARMY AMMUNITION PLANT IRP Schedule

SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-012	Pyotts Pond & Sludge Disposal Area	RFI/CMS						
		DES						
		CMI(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-013	South Acid Area LWTP Evap. Lagoons	CS						
		IRA						
		LTM						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-014	Rocket Static Test Area	RFI/CMS						
		IRA						
		LTM						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-015	Waste Storage Magazines	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-016	Temporary Waste Storage Magazines	RFI/CMS						
		LTM						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-017	G-Line Area Ditches	RFI/CMS						
		DES						
		IRA						
		CMI(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-018	Old/New Sanitary Landfill	DES						
		CMI(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-019	Ash Landfills	RFI/CMS						
		IRA						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-020	Ash Lagoons	RFI/CMS						
		IRA						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-021	Contaminated Materials Burn Ground	CMI(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-022	Old Explosive Waste Burning Ground	IRA						
		CMI(C)						

SUNFLOWER ARMY AMMUNITION PLANT IRP Schedule

SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-024	Nitroglycerine and Paste Mix Areas	RFI/CMS						
		DES						
		IRA						
		CMI(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-025	Nitrocellulose Area Ditches	DES						
		CMI(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-026	Single Base Propellant Area Sumps	RFI/CMS						
		DES						
		IRA						
		CMI(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-027	NQ Area SAC & LWTP Evap. Lagoons	LTM						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-030	Pesticide Handling Area	RFI/CMS						
		DES						
		CMI(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-031	Contaminated Waste Processor	RFI/CMS						
		DES						
		IRA						
		CMI(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-032	Lead Decon. and Recovery Unit	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-033	Paste Area Half Tanks & Ditches	LTM						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-034	Five Corners Settling Ponds	RFI/CMS						
		IRA						
		LTM						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-035	Nitroglycerine Area Settling Ponds	LTM						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-036	N-Line Area	RFI/CMS						
		DES						
		CMI(C)						
		LTM						

SUNFLOWER ARMY AMMUNITION PLANT IRP Schedule

SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-037	Sandblast Areas	RFI/CMS						
		DES						
		CMI(C)						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-038	Oil Water Separator	DES						
		CMI(C)						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-039	South Acid Area Ditches	RFI/CMS						
		IRA						
		LTM						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-040	Calcium Cyanimide Disposal Area	RFI/CMS						
		DES						
		CMI(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-041	Calcium Carbonate Cake Landfill	CMI(O)						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-042	Temporary Sanitary Landfill	LTM						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-043	Tunnel Dryers (CCC Storage)	RFI/CMS						
		DES						
		IRA						
		CMI(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-044	Tank T784	RFI/CMS						
		LTM						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-045	Bldg 9040 & Ca. Cyanamide Conveyor	RFI/CMS						
		LTM						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-046	Decontamination Oven	RFI/CMS						
		DES						
		IRA						
		CMI(C)						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-047	Nitroguanidine Area (25) Sumps	RFI/CMS						
		DES						
		IRA						
		CMI(C)						
		LTM						

SUNFLOWER ARMY AMMUNITION PLANT IRP Schedule

SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-048	Nitroguanidine Support Area	RFI/CMS						
		IRA						
		LTM						
SAAP-050	Disposal Site East of SWMU 1	LTM						
SAAP-051	New Reclamation Yard	RFI/CMS						
		DES						
		CMI(C)						
		LTM						
SAAP-052	Paint Bay Building 542	RFI/CMS						
SAAP-053	Burn and Debris Area North of STP	RFI/CMS						
		DES						
		CMI(C)						
		LTM						
SAAP-054	Fluorescent Tube Wells	RFI/CMS						
SAAP-057	Chemical Preparation House	RFI/CMS						
		DES						
		CMI(C)						
		LTM						
SAAP-058	Combined Shops Area	RFI/CMS						
		DES						
		CMI(C)						
		LTM						
SAAP-059	Laundry Facility	RFI/CMS						
		DES						
		IRA						
		CMI(C)						
SAAP-062	Transformer Storage Warehouse 566-5	RFI/CMS						
		DES						
		CMI(C)						
SAAP-063	Water Towers	RFI/CMS						
		DES						
		CMI(C)						

SUNFLOWER ARMY AMMUNITION PLANT IRP Schedule

SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-064	Paper Burning Ground	RFI/CMS						
		DES						
		CMI(C)						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-065	Tank Farm	RFI/CMS						
		DES						
		IRA						
		CMI(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-066	Installation-wide Stream Study	DES						
		CMI(C)						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-067	South Acid Area	RFI/CMS						
		DES						
		IRA						
		CMI(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-101	Monitoring Well West of Old Admin B	RFI/CMS						
		LTM						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-102	Main Electrical Switch Yard	RFI/CMS						
		DES						
		CMI(C)						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-105	Canon Range Tunnels (Facility 303)	RFI/CMS						
		DES						
		CMI(C)						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-106	Process Facilities with F-Line Area	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-107	Truck Maintenance Shop, South Acid	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-108	Fuel Oil Storage Tank, South Acid	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-109	Oil & Paint House, South Acid	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-110	Storage Magazines Not in SWMU 15,16	RFI/CMS						
		LTM						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-111	Forced Air Dryers	RFI/CMS						
		DES						
		CMI(C)						

SUNFLOWER ARMY AMMUNITION PLANT IRP Schedule

SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-112	Paste Air Dry Facilities	RFI/CMS						
		DES						
		IRA						
		CMI(C)						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-114	Robert's Lake	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-115	Hazard Analysis Testing Lab	RFI/CMS						
		DES						
		CMI(C)						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-116	Nitrocellulose Production Lines	RFI/CMS						
		DES						
		IRA						
		CMI(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-117	Nitroguanidine Production Buildings	RFI/CMS						
		DES						
		IRA						
		CMI(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-118	Trench Disposal Area A3	RFI/CMS						
		DES						
		CMI(C)						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-119	Trench Disposal Area A4	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-120	Trench Disposal Area A5	RFI/CMS						
		DES						
		CMI(C)						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-121	Trench Disposal Area A6	RFI/CMS						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-122	Old Reclamation Yard	RFI/CMS						
		DES						
		CMI(C)						
SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-123	Cleanup Under Explosive Foundations	RFI/CMS						
		IRA						

SUNFLOWER ARMY AMMUNITION PLANT IRP Schedule

SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
SAAP-124	Cleanup Under Explosive Sewers	RFI/CMS						
		IRA						

SUNFLOWER ARMY AMMUNITION PLANT

Non-BRAC Excess
Compliance Restoration

CR Summary

Installation Total Army Environmental Database-Restoration (AEDB-R) Sites/Closeout Sites Count: 7/0

Installation Site Types with Future and/or Underway Phases

2 Above Ground Storage Tank
(CCSAAP-103, CCSAAP-126)
3 Contaminated Soil Piles
(CCSAAP-055, CCSAAP-061, CCSAAP-113)
1 Landfill
(CCSAAP-069)
1 Spill Site Area
(CCSAAP-070)

Most Widespread Contaminants of Concern

Asbestos, Dioxins/Dibenzofurans, Lead Based Paint, Metals, Nitrate/Nitrite, Pesticides, Petroleum, Oil and Lubricants (POL), Polychlorinated Biphenyls (PCB), Polycyclic Aromatic Hydrocarbons (PAH), Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern

Groundwater, Sediment, Soil, Surface Water

Completed Remedial Actions (Interim Remedial Actions / Final Remedial Actions (IRA/FRA))

Site ID	Site Name	Action	Remedy	FY	Cost
N/A					

Duration of CR

Year of CR Inception: 199701

Estimated Date for Remedy-In-Place (RIP)/Response Complete (RC): 201508/201508

Date of CR completion including Long Term Management (LTM): 202008

CR Contamination Assessment

Contamination Assessment Overview

Environmental restoration activities include the IRP and Military Munitions Response Program (MMRP). On Dec. 29, 2008, the Office of the Deputy Under Secretary of Defense for Installations and Environment, [ODUSD (I&E)], issued an interim policy for Defense Environmental Restoration Program (DERP) eligibility that rescinded the 1986 eligibility date for the IRP and the 2002 eligibility date for the MMRP. This made many sites previously addressed in the Army's Compliance-related Cleanup (CC) Program eligible for the DERP. Sites that are now eligible for the Munitions Response (MR) program have been migrated from Army Environmental Database-Compliance-related Cleanup (AEDB-CC) and given the naming convention of other MR sites. The newly eligible non-MR type sites are considered to be Installation Restoration (IR) sites; however, the newly eligible sites are being coded as CR in AEDB-R to distinguish them from the original IR sites and IR Metrics. See IR Contamination Assessment Overview for more information.

Cleanup Exit Strategy

In order for SFAAP to get NFA approved by the regulators many sites require additional investigation and some sites require an initial investigation. Sites that contain contaminants in the soil/sediments above risk levels will be remediated. After soil contamination is remediated the contaminated groundwater will undergo MNA. Specifics can be found in cleanup exit strategies for each site.

CR Previous Studies

Title	Author	Date
There are no Previous Studies		

SUNFLOWER ARMY AMMUNITION PLANT

Non-BRAC Excess

Compliance Restoration

Site Descriptions

Site ID: CCSAAP-055
Site Name: Old Aministration Buildings
Alias: SWMU 55

STATUS

Parcel: NONE

Regulatory Driver: RCRA

Contaminants of Concern: Asbestos, Lead Based Paint

Media of Concern: Soil

Phases	Start	End
RFA	199701	199810
CS	199903	199908
RFI/CMS	201408	201508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises seven acres in the northeast portion of the installation. This area was used for offices for administrative personnel. Two large (156,114 square feet each) buildings were built in 1942. These buildings were covered with Transite Siding in 1952. Asbestos fragments are in the soil surrounding these buildings. Also commingled with the asbestos in the soil are flakes of lead-based paint. The buildings are still standing. The buildings were no longer used after 1976. In the 1998 EBS this area was listed as an area where there were possible releases or disposal of hazardous substances. This site is in USEPA's RCRA Corrective Action Permit as SWMU 55 due to flaking lead-based paint. The Old Photographic Laboratory within Building 214 is SAAP-060 and is being handled separately.

The RFI involves sampling for flaking lead-based paint in the soil.

No cleanup is anticipated.

CLEANUP/EXIT STRATEGY

The RFI is expected to demonstrate no risk at the site and allow for an NFA determination.

Site ID: CCSAAP-061
Site Name: Environmental Laboratory Bldg 232
Alias: SWMU 61

STATUS

Parcel: NONE

Regulatory Driver: RCRA

Contaminants of Concern: Nitrate/Nitrite

Media of Concern: Soil

Phases	Start	End
RFA	199710	199810
CS	199901	199909
RFI/CMS	200408	201408
DES	201410	201412
CMI(C)	201501	201508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises one acre in the north central portion of the installation. This area was used as an Environmental Laboratory. This 4,424 square feet building (Building 232) was constructed in 1943 and was initially used as a Change House. In 1982 the building was modified into a laboratory and was used to analyze environmental samples. This laboratory was active until 2003. Past waste disposal practices are not documented. In the 1998 EBS this area was listed as an area where there were possible releases or disposal of hazardous substances. An RFI was performed in 2004. Releases of nitrated compounds and ammonia leaked through the floor slab and caused ammonia concentrations in the soil under the slab to exceed risk level. A groundwater investigation was conducted in 2008. Groundwater samples indicated no contaminants above risk levels. This site is in USEPA's RCRA Corrective Action Permit as SWMU 61.

RFI activities include collecting three surface soil samples at the three doors that exit Building 232.

The corrective measures will be excavation of contaminated soil where there were three exceedances of the industrial TMCL for ammonia. The Army does not clean up applied pesticides.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is not anticipated at this site.

Site ID: CCSAAP-069
Site Name: Disposal Area North of Old Quarry
Alias: SWMU 69

STATUS

Parcel: NONE

Regulatory Driver: RCRA

Contaminants of Concern: Asbestos, Metals, Polycyclic Aromatic Hydrocarbons (PAH)

Media of Concern: Soil

Phases	Start	End
RFA	201211	201211
CS	201212	201212
RFI/CMS	201310	201408
DES	201410	201412
CMI(C)	201501	201508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises one acre in the northeast portion of the installation. This area was used as a disposal area prior to and during construction of SFAAP. This disposal area contains asbestos (broken transite, pipe insulation), rusted drums containing unidentified material, glass, metal and other debris. This is an unpermitted disposal area on a long steep slope with exposed asbestos and other possibly toxic contaminants. This area was discovered in December 2012 by the Army during a site walk. Animals have dug holes exposing these materials. The slope of the disposal area is very steep and in most of the area exceeds 45 degrees (one-to-one).

Prior to starting RFI fieldwork the area need to be cleared of cedar trees and other small trees in order to adequately investigate this site. RFI activities include using a trackhoe to dig exploratory trenches to delineate the boundaries of the disposal areas. Subsurface soil samples will be collected at locations of trench bottom just below perimeter of debris looking for potential contamination. An estimated failure rate of 15 percent of these samples having contaminants above TMCLs requires step out samples to horizontally delineate the surface soil contamination to get a complete boundary of the disposal areas. Soil samples will be analyzed for RCRA metals, SVOCs, VOCs, TPH-DRO, and TPH-GRO. Groundwater monitoring wells will be installed and groundwater samples collected.

The corrective measures will be excavation of contaminated soils where there are exceedances of TMCLs, and the asbestos and other debris and disposal at a permitted landfill.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is not anticipated at this site.

Site ID: CCSAAP-070
Site Name: Diesel Fuel Spill at Bldg 129-2
Alias: SWMU 70

STATUS

Parcel: NONE

Regulatory Driver: RCRA

Contaminants of Concern: Petroleum, Oil and Lubricants (POL), Polycyclic Aromatic Hydrocarbons (PAH), Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Sediment, Soil

Phases	Start	End
RFA	201211	201211
CS	201212	201212
RFI/CMS	201310	201408
DES	201410	201412
CMI(C)	201501	201508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises 26 acres in the north central portion of the installation. This area is the drainage ditch contaminated from a diesel fuel spill at Building 129-2. This site includes Building 129-2 and the drainage from 129-2 to the installation's north boundary. The treated river water storage tank (Building 129-1) holds 12 million gallons of water and was built in 1943. The Booster Station and Pump House (Building 129-2) is 7,503 square feet built in 1943 and contains multiple motors and pumps. There were three ASTs, two diesel fuel and one gasoline. This area was no longer used after 1992. An oil water separator was installed north of building 129-2 in 1969. A documented spill occurred in 1984. The spill occurred as a result of a failure in an underground line leading from the two aboveground diesel fuel tanks. The two diesel fuel tanks were used to supply fuel to run the diesel motors that powered the water pumps associated with the 12 million gallon reservoir. Approximately 1,400 gallons of diesel fuel leaked from the tanks over a span of 24 days. The underground pipe exiting the concrete tank containment basins broke loose. The piping and contaminated soil was excavated. The soil was cleaned to visual level, i.e. no soil samples were taken. According to the spill records straw, hay, sorbent pads and sorbent booms were used to absorb the fuel and prevent further flow from the area. Visually impacted soil in the area was excavated and the bottom and banks of the downgradient ditch were burned off with a portable propane burner. The diesel fuel collected in the oil water separator and was burned off and absorbed with sorbent booms. A site walk in December 2012 identified an oily black sheet in the oil water separator.

RFI activities include collecting surface soil, and subsurface soil samples at locations of potential contamination. The ditch from the oil/water separator to the plant boundary is 1,837 linear feet. One sample will be collected every 50 feet. Soil samples will be collected around the oil/water separator, the diesel fuel tanks pit, the gasoline tank pit, and next to the two drop inlets. An estimated failure rate of 15 percent of these samples having contaminants above TMCLs requires step out samples to horizontally delineate the surface soil contamination Soil samples will be analyzed for RCRA metals, SVOCs, VOCs, TPH-DRO, and TPH-GRO. Groundwater monitoring wells will be installed and groundwater samples collected.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

CLEANUP/EXIT STRATEGY

Site ID: CCSAAP-070
Site Name: Diesel Fuel Spill at Bldg 129-2
Alias: SWMU 70

The RFI is expected to demonstrate unacceptable risk at the site. Excavation and disposal of contaminated soil are expected to allow for an NFA determination. LTM is not anticipated at this site.

Site ID: CCSAAP-103
Site Name: New Photographic Laboratory 227-18
Alias: AOC 3

STATUS

Parcel: NONE

Regulatory Driver: RCRA

Contaminants of Concern: Metals

Media of Concern: Soil

Phases	Start	End
RFA	199701	199810
CS	199901	199909
RFI/CMS	200408	201408
DES	201410	201412
CMI(C)	201501	201508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises one acre in the north central portion of the installation. This area was used as a photographic laboratory, blueprint printer and engineering drafting office. This 3,511 square foot building (Building 227-18) was constructed in 1943 and was initially used as a Change House. In 1990 the building was modified into a photographic laboratory, blueprint printer and engineering drafting office. This building was active until 1998. Based on interviews a common waste disposal practice in the photographic laboratory was to dispose of the waste in the sinks. The location of the sink drain outfall has been identified. The large blueprint machine used ammonia in the printing process. In the 1998 EBS this area was listed as an area where there were possible releases or disposal of hazardous substances. An RFI was conducted in 2004. Soil sampling results indicated no contaminants above risk levels. A request for NFA was submitted to KDHE in 2008. KDHE denied the NFA request with comments that identified data gaps requiring more soil samples. This site is in USEPA's RCRA Corrective Action Permit as AOC 3.

RFI activities include collecting one subfloor soil sample at the ammonia tanks, one surface soil sample at the outside waste tank east of the blueprint room, and one surface soil sample at the outside waste tank east of the photo lab dark room. These samples will be analyzed for RCRA metals, manganese, SVOCs, VOCs, ammonia, and nitrate.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is not anticipated at this site.

Site ID: CCSAAP-113
Site Name: General Warehouses (8037 Series)
Alias: AOC 13

STATUS

Parcel: NONE

Regulatory Driver: RCRA

Contaminants of Concern: Metals, Polycyclic Aromatic Hydrocarbons (PAH)

Media of Concern: Soil

Phases	Start	End
RFA	199701	199810
CS	199901	199909
RFI/CMS	200408	201408
DES	201410	201412
CMI(C)	201501	201508

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises 15 acres in the east central portion of the installation. This area was used for storing plant parts, an assortment of supplies, process equipment taken out of commission for reuse or disposal, unused packing drums for NQ, and unused packing containers for 2.75 inch rocket grains. Two 10,400 square foot buildings were constructed in 1945, and six more were constructed in 1952. Each warehouse has 12 overhead doors and four wooden unloading/loading ramps. All eight buildings are still standing. The warehouses are currently empty except for an estimated 700,000 of the 2.75 inch rocket grain packing containers. Located within this area is Building 309, the Cannon Unloading Station. The 1,720 square feet unloading station was built in 1943. In the 1998 EBS this area was listed as an area where there were possible releases or disposal of hazardous substances. An RFI was conducted in 2004. Soil samples had exceedances for lead and indeno(1,2,3-cd)pyrene. The sample locations with exceedances were excavated in 2005. This ICM work was funded by non-ER,A funds and therefore is not shown in the phase schedule. A request for NFA was submitted to KDHE in 2008. KDHE denied the NFA request with comments that identified data gaps requiring more soil samples. Exceedance of cobalt and a hydraulic oil spill require further characterization and cleanup. This site is in USEPA's RCRA Corrective Action Permit as AOC 13.

RFI activities include collecting surface soil samples in 3,200 linear feet of drainage ditches in AOC 13. One sample will be taken every 100 feet and analyzed for RCRA metal, cobalt, manganese, SVOCs, VOCs, explosives (including NC, NG, NQ), and PCBs. Surface soil step out samples will be collected to horizontally delineate the cobalt exceedance from a previous RFI. Surface soil step out samples will be collected to delineate a reported hydraulic oil spill. The samples will be analyzed for TPH-DRO, SVOC-PAHs, and PCBs.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination.. LTM is not anticipated at this site.

Site ID: CCSAAP-126
Site Name: Power Houses
Alias: AOC 26

STATUS

Parcel: NONE

Regulatory Driver: RCRA

Contaminants of Concern: Petroleum, Oil and Lubricants (POL), Polycyclic Aromatic Hydrocarbons (PAH)

Media of Concern: Soil

Phases	Start	End
RFA	201210	201211
CS	201211	201212
RFI/CMS	201401	201408
DES	201410	201412
CMI(C)	201501	201508
LTM	201510	202008

RIP Date: N/A

RC Date: 201508

SITE DESCRIPTION

This site comprises 66 acres in the central portion of the installation. This area was used for steam production by burning coal. There were three Power Houses (Buildings 154-1 thru 3), with various subaccounts: Thaw Sheds, Shakeout Houses, Pump Houses, Control Houses, Electrostatic Precipitators, Coal Unloading Shelters, Boiler Shelter Houses, Fuel Oil Storage Tanks. These structures were built in 1943. In the 1998 EBS this area was listed as a Category 2 area, which is any area where only release or disposal of petroleum products has occurred. Fuel oil spills were reported. ACM and lead-based paint may be present in soil. Power House 154-1 is still standing. Power Houses 154-2 and 154-3 have been demolished.

RFI activities include collecting surface soil and subsurface soil samples at locations of potential contamination. Surface soil samples will be collected from around each power house building/foundations, at each coal pad (155-2, 155-3), and from around and under the containment area of the two 750,000-gallon fuel oil tanks at power house 3. Subsurface soil samples will be collected at areas where fuel oil was stored or spilled. Soil samples will be analyzed for RCRA metals, SVOCs, VOCs, TPH-DRO, and TPH-GRO. Groundwater monitoring wells will be installed and groundwater samples collected.

The corrective measures will be excavation of contaminated soils where there were exceedances of industrial TMCLs. The failure rate is estimated at 15 percent for soil/sediment samples. An estimated failure rate of 25 percent for post excavation confirmation samples of the excavation grids will require re-remediation. The excavation grid size is 900 square feet.

Post excavation confirmation samples (one per 900 square feet) will be collected after the contaminated soil is excavated and stockpiled. The contaminated soil stockpiles will be sampled (one per 500 cy) for waste characterization to ensure proper disposal as a solid waste or hazardous waste. After the contaminated soil stockpiles are disposed of, the area where the stockpiles were will be sampled one per 285 cy (based on historic average for one sample every 900 square feet from stockpile base) to ensure no contamination remains above TMCLs.

LTM is planned and involves sampling four wells twice a year for five years. Contaminants to analyze for in the groundwater samples are SVOC-PAHs and TPH-DRO.

CLEANUP/EXIT STRATEGY

Based on the result of the RFI, excavation and disposal of contaminated soil will be planned and completed as needed to allow for an NFA determination. LTM is anticipated at this site. LTM and five-year reviews will ensue until closure is achieved. The LTM phase includes quarterly inspections, an annual assessment, and five-year reviews and LUCs in accordance with the installation-wide LUC implementation plan. The LUCs will be on-site controls with no drilling and will continue until closure is achieved.

CR Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
There are no NFA sites			

CR Schedule

Date of CR Inception: 199701

Past Phase Completion Milestones

1999

CS	(CCSAAP-055 - Old Aministration Buildings, CCSAAP-061 - Environmental Laboratory Bldg 232, CCSAAP-103 - New Photographic Laboratory 227-18, CCSAAP-113 - General Warehouses (8037 Series))
RFA	(CCSAAP-055 - Old Aministration Buildings, CCSAAP-061 - Environmental Laboratory Bldg 232, CCSAAP-103 - New Photographic Laboratory 227-18, CCSAAP-113 - General Warehouses (8037 Series))

Projected Phase Completion Milestones

See attached schedule

Projected Record of Decision (ROD)/Decision Document (DD) Approval Dates

To Be Determined

Final RA(C) Completion Date: 201508

Schedule for Next Five-Year Review: 2016

Estimated Completion Date of CR at Installation (including LTM phase): 202008

SUNFLOWER ARMY AMMUNITION PLANT CR Schedule

= phase underway

SITE ID	SITE NAME	PHASE	FY14	FY15	FY16	FY17	FY18	FY19+
CCSAAP-055	Old Aministration Buildings	RFI/CMS						
SITE ID	**SITE NAME**	**PHASE**	**FY14**	**FY15**	**FY16**	**FY17**	**FY18**	**FY19+**
CCSAAP-061	Environmental Laboratory Bldg 232	RFI/CMS						
		DES						
		CMI(C)						
SITE ID	**SITE NAME**	**PHASE**	**FY14**	**FY15**	**FY16**	**FY17**	**FY18**	**FY19+**
CCSAAP-069	Disposal Area North of Old Quarry	RFI/CMS						
		DES						
		CMI(C)						
SITE ID	**SITE NAME**	**PHASE**	**FY14**	**FY15**	**FY16**	**FY17**	**FY18**	**FY19+**
CCSAAP-070	Diesel Fuel Spill at Bldg 129-2	RFI/CMS						
		DES						
		CMI(C)						
SITE ID	**SITE NAME**	**PHASE**	**FY14**	**FY15**	**FY16**	**FY17**	**FY18**	**FY19+**
CCSAAP-103	New Photographic Laboratory 227-18	RFI/CMS						
		DES						
		CMI(C)						
SITE ID	**SITE NAME**	**PHASE**	**FY14**	**FY15**	**FY16**	**FY17**	**FY18**	**FY19+**
CCSAAP-113	General Warehouses (8037 Series)	RFI/CMS						
		DES						
		CMI(C)						
SITE ID	**SITE NAME**	**PHASE**	**FY14**	**FY15**	**FY16**	**FY17**	**FY18**	**FY19+**
CCSAAP-126	Power Houses	RFI/CMS						
		DES						
		CMI(C)						
		LTM						

Community Involvement

Technical Review Committee (TRC): None

Community Involvement Plan (Date Published): 199703

Restoration Advisory Board (RAB): RAB established 1998

RAB Adjournment Date: 200701

RAB Adjournment Reason: Installation Commander determined RAB should be adjourned.

Additional Community Involvement Information

On May 6, 1998, SFAAP conducted the first RAB meeting with 17 community members attending. Six additional positions were created as follows: two for the Army and one each for the operating contractor, USEPA, KDHE and US Army Corps of Engineers. RAB meetings were conducted monthly for the first six months and then bimonthly. The Installation Commander determined that the Army RAB should be adjourned because the cleanup of SFAAP was being performed by SRL under a CO with KDHE. The non-Army RAB continued to meet bimonthly and is co-chaired by a member of SRL. The Army is a member of SFAAP's non-Army RAB. SFAAP's non-Army RAB meetings were suspended in May 2011 because all work on SFAAP's restoration program was put on hold due to insufficient funds.

Previous meetings included activities such as:
- An installation tour
- Individual site briefings (including discussion of past practices and existing contamination)
- Educational presentations (risk assessment, how investigations are conducted, explanation of technical documents, etc.)
- Land use plan briefings presented by Johnson County
- Presentation by potential developer on the property to explain their proposal for potential site remediation

The non-Army RAB will resume meetings when fieldwork resumes.

Administrative Record is located at

Sunflower Army Ammunition Plant
35425 West 103rd St.
DeSoto, KS, 66018-0640
913-948-9615

Information Repository is located at

Johnson County Public Library
9875 W. 87th St.
Overland Park, KS, 66212
913-826-4600

Current Technical Assistance for Public Participation (TAPP): N/A

TAPP Title: N/A

Potential TAPP: N/A